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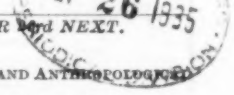

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ADDRESSES AND ORIGINAL ARTICLES

PERFORATION OF THE ŒSOPHAGUS BY SWALLOWED FOREIGN BODIES

By John E. G. McGibbon, M.B. Lond., D.L.O.
HON. LARYNGOLOGIST, ROYAL SOUTHERN HOSPITAL, LIVERPOOL

With Radiological Notes by

J. H. Mather, B.Sc., M.B. Liverp., D.M.R.E.
HON. RADIOLOGIST TO THE HOSPITAL

Writing in this journal last year Scott-Brown [1] drew attention to the frequency of perforations of the œsophagus by carcinoma, and there is no doubt that neoplasm is the most common cause of such lesions. Perforation by swallowed foreign bodies would probably rank second in frequency, although it is possible that many cases pass unrecognised, as the diagnosis is not always easy and spontaneous recovery may occur. Nevertheless, all such accidents are fraught with danger and any one may end in tragedy.

The three following cases have been observed recently.

Case 1.—Female, aged 32. On Nov. 29th, 1932, while eating stewed rabbit, she thought a bone had stuck in her throat. She complained of dysphagia and pain on attempting to swallow, but on examination in hospital four hours later no abnormality was found. X ray examination showed a "hitch in passage of opaque paste middle-third of œsophagus—? foreign body in this region." Œsophagoscopy revealed no foreign body, but a small wound of the posterior œsophageal wall 8½ inches from the incisor teeth was visible. The presence of a perforation was not suspected, and the patient was discharged next day still complaining of pain on swallowing. The pain persisted after discharge, until she died unexpectedly a week later. Following her discharge from hospital she had been in the care of her own family doctor, who had observed no abnormal physical signs except a slightly irregularly elevated temperature. Autopsy showed a purulent infection of the entire retro-œsophageal and retro-pharnygeal spaces. No foreign body was found.

Case 2.—Male, aged 26. After eating fish on June 17th, 1934, he felt a pain in his throat as if a bone were lodged there. He experienced pain but no difficulty on swallowing. He came to hospital on June 22nd when nothing abnormal was found on examination. X ray report was as follows: "This patient has a large accumulation of gas (air) in his mediastinum pointing to perforation of his pharynx or œsophagus. The upper portion of the œsophagus is displaced laterally. No 'hold-up' of test food." Œsophagoscopy showed a small wound of the posterior œsophageal wall 8 inches from the incisor teeth. The patient was detained in hospital for ten days, during which time he complained of slight dysphagia; but at no time was his temperature raised or his pulse-rate increased. He was last radiographed on July 9th, 1934, when the report was: "Small amount of air still present."

Case 3.—Female, aged 22. Was eating cod on Nov. 28th, 1934, when she felt a bone stick in her throat. On admission to hospital on Dec. 1st examination showed no abnormality. X ray report: "The œsophagus is displaced forwards and to the left, by a swelling (post-œsophageal) level to 1st to 4th D.V. ? Abscess ? air in mediastinum." Œsophagoscopy showed that at the level of the first dorsal vertebra there was an acute œsophagitis which extended downwards for 2½ inches. No foreign body was seen, nor was any wound of the œsophageal mucosa visible. She was kept under observation in hospital for 14 days, during which time the air was gradually absorbed; and whilst an in-patient she exhibited no rise of temperature or increased pulse-rate.

Wright [2] recently reported three somewhat similar cases. One of his patients died of purulent mediastinitis and empyema; one developed a large mediastinal abscess which pointed and was drained above the clavicle; and one made a spontaneous recovery.

Foreign body perforations may occur either through the cervical or the thoracic portion of the œsophagus. Naturally, owing to the relative inaccessibility of the viscus and its intimate relationship to other important organs, the prognosis is graver, and the patient's chances of recovery are more remote, when the lesion is in the latter situation.

The perforation may be caused by the foreign body itself, by the patient's efforts to rid himself of the intruder, or by faulty or careless technique with instruments. Orton [3] has stated that perforating foreign bodies may be classified as those that perforate at once and those that perforate by erosion. Sharp fragments of bones, fish-bones, pins, and sharp pieces of metal cause immediate perforations. Perforation due to ulceration and erosion is usually due to prolonged sojourn of a foreign body in the œsophagus. It is recognised that insoluble organic matter, such as bone with adherent meat, will cause ulceration more rapidly than inorganic objects such as coins, and that the mortality is higher in cases of immediate than in cases of delayed perforation.

The vulnerability of the œsophagus is well known, and it is probable that a large number of perforations are completed by the patient's own efforts—e.g., straining, vomiting and hawking, pushing fingers and spoons down the pharynx, swallowing hard crusts, &c.—but I can find only one example recorded—viz., Berry's [4] account of a case in which a woman perforated her own œsophagus with a corset stiffener in her efforts to remove a foreign body, with fatal results. Instrumental perforations are probably becoming less common as the dangers of the coin-catcher and probang are more generally recognised. Injuries with the œsophagoscope, however, do occur and Friedenwald and Morrison [5] have recorded a series of such cases, all of which ended fatally.

Anatomy of the Region

The majority of perforations take place into the cellular spaces surrounding the œsophagus, and it will be advisable briefly to describe these.

Throughout the greater part of its course from the pharynx to the diaphragm the œsophagus is contained within a definite fascial space. This space has been called by Furstenberg [6] the "visceral space" (Figs. I. and II. and Fig. III. 8). Anteriorly it is limited by the pretracheal fascia and pericardium; laterally by the carotid sheaths of the cervical fascia and mediastinal pleuræ; and posteriorly by the bucco-pharyngeal fascia and its prolongation downwards on the posterior surface of the œsophagus.

Posteriorly to the pharynx and œsophagus is the so-called "retrovisceral" space (Fig. I. 4, Fig. III. 9). This is made up of the retro-pharyngeal and retro-œsophageal spaces. It is bounded anteriorly by the bucco-pharyngeal fascia and its mediastinal prolongation, and the vertical part of the diaphragm; laterally by the carotid sheaths and the mediastinal pleuræ; and posteriorly by the prevertebral fascia and the anterior common ligament of the lower thoracic vertebræ.

The areolar tissue of these spaces is of loose texture,

and Lambert and Berry [7] have shown that its processes dip in between the leaves of the pulmonary ligaments, and follow the bronchial tree as far as the tertiary bronchi (Fig. II. a). In their opinion inflammatory involvement of these prolongations gives rise to many of the so-called "root-shadows." It is also in continuity with the areolar tissue outside the pleura—the endothoracic fascia (Fig. II. b). Bernard and Mallet-Guy [8] have demonstrated that the adherence of the parietal pleura to the ribs is strongest at the line of costovertebral articulation, the adherence being much less over the intercostal spaces. Extension of inflammation along this endothoracic path gives rise to characteristic shadows with well-defined but irregularly toothed borders, which appear to widen the mediastinal shadow by X ray examination.

The anatomical continuity of these cellular spaces and of their contained viscera and blood-vessels without the interposition of any fascial barriers allows of definite pathways up and down. Their density, however, is not equal throughout, and von Hacker [9] has pointed out that this is greater in the lower part in as much as inflammatory exudates of the upper portion have no great tendency to spread downwards, whereas they readily migrate upwards towards the neck.

Lerche [10] injected a suspension of barium in buttermilk into the groove between the trachea and œsophagus; with moderate force this was found to extend laterally along the œsophagus and trachea to a few centimetres below the bifurcation where it entered the retro-œsophageal region; and there is boundless clinical and other experimental evidence to prove that the continuity of these spaces is a very real and important one.

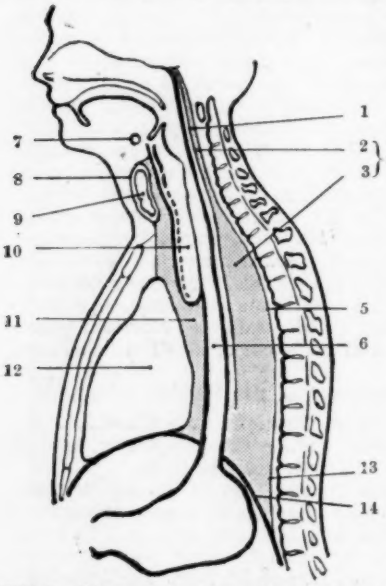

FIG. I.—Diagram of para-œsophageal spaces. (1) Bucco-pharyngeal fascia. (2) Retro-pharyngeal space. (3) Retro-œsophageal space. (4) Retrovisceral space. (5) Prevertebral fascia. (6) Œsophagus. (7) Hyoid bone. (8) Pretracheal fascia. (9) Thyroid gland. (10) Trachea. (11) Visceral space. (12) Pericardial sac. (13) Anterior common ligament. (14) Diaphragm.

These cellular spaces are shown diagramatically as the shaded areas in Figs. I.–III. They include the retro-pharyngeal and the retro-œsophageal spaces, the visceral compartment of the deep cervical fascia, a portion of the superior and the entire posterior mediastina; and for the purposes of these notes they will be referred to collectively as the para-œsophageal spaces.

The more important structures contained within, or in relation to, these spaces are the trachea and its bifurcation, the pleuræ and lungs, the aorta, the carotid arteries, internal jugular veins, the azygos veins, thoracic duct, and the pericardium.

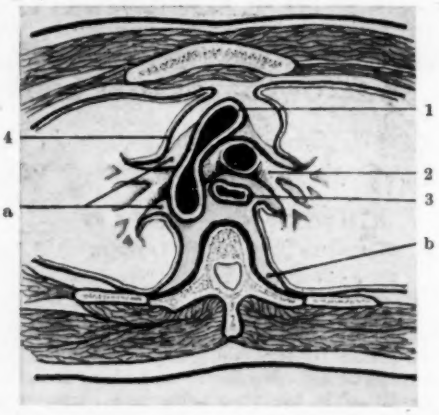

FIG. II.—Diagram of para-œsophageal spaces at level of IVth and Vth dorsal vertebræ. (1) Aortic arch. (2) Right bronchus. (3) Œsophagus. (4) Pleura. (*a*) Tissue extending into pulmonary ligament and hilum. (*b*) Endothoracic fascia.

Symptoms and Signs

Symptoms usually predominate over signs after impaction of a foreign body in the œsophagus, and patients are well aware that "something is stuck in the throat." They complain of pain and dysphagia, which may vary from slight difficulty to complete obstruction. Occasionally such patients may regurgitate or hawk up blood-streaked sputum. Wright [2] has stressed the importance of local tenderness on pressure over the trachea. Tucker [11] considers that it is pathognomonic of the presence of a foreign body in the upper œsophagus if by moving the trachea or larynx towards the point of maximum tenderness, as indicated by the patient, there is a marked increase of pain at this point.

If perforation has occurred, increasing pain is the dominant symptom; but, unless perforation is followed by the escape of air or of infection into the para-œsophageal spaces, it may give rise to no symptoms or signs other than those enumerated above. Lederer and Fishman [12] published an account of a female patient who swallowed over one hundred pins, two hairpins, and five safety-pins, three of which were opened. She manifested no signs or symptoms and voided all the foreign bodies per rectum, yet it is safe to assume that at least one of these sharp bodies perforated the œsophageal wall. This absence of symptoms may be misleading, and Brown [13] has reported two cases of symptomless perforation of the œsophagus, in both of which the patient died subsequently from septic pulmonary complications.

Air may escape through the perforation, giving rise to emphysema. This may occur suddenly owing to straining efforts, or as Seiffert [14] has pointed out it may be brought about gradually by the combined actions of inspiration and a valvular perforation—and not by swallowing air. If the leakage is in the cervical region, it is often accompanied by subcutaneous emphysema, which may be very extensive, reaching down on to the thoracic wall and up into the eyelids and scalp. If it is in the thoracic region there will be a collection of air or gas in the para-œsophageal spaces, which will displace the œsophagus and cause dysphagia. This happened in two of the cases reported above and the X ray appearances are shown in Fig. IV. Uncomplicated para-œsophageal emphysema appears to be a rela-

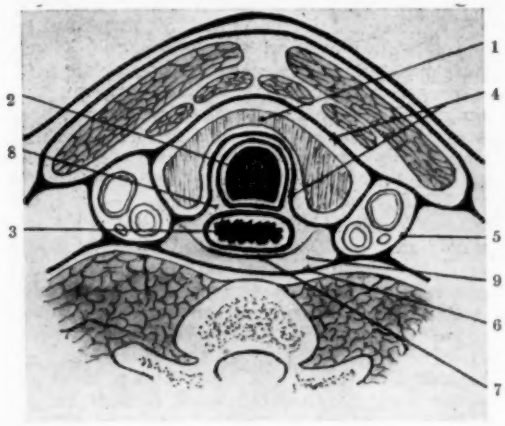

FIG. III.—Para-œsophageal spaces at level of VIIth cervical vertebræ. (1) Thyroid gland. (2) Trachea. (3) Œsophagus. (4) Pretracheal fascia. (5) Carotid sheath. (6) Prevertebral fascia. (7) Œsophageal prolongation of bucco-pharyngeal fascia. (8) Visceral space. (9) Retrovisceral space.

tively benign lesion, although Chevalier Jackson [15] states that it "may prove fatal whether infection follow the leaking air or not." In such cases there are no signs of constitutional disturbance and the only symptoms are dysphagia and pain. It is conceivable, however, that with a massive para-œsophageal collection of air the cardiac and respiratory functions might become considerably embarrassed.

Infection following Perforation

If infection follows a perforation, signs of constitutional disturbance will be manifest and the patient's symptoms become more obvious. Increasing dysphagia with more severe pain, aggravated by attempts to swallow, and a rising temperature and pulse-rate are indications of para-œsophageal infection. Infection usually proceeds to suppuration unless it accompanies gross trauma, when death may ensue before there is time for pus formation.

Infection may be limited and give rise to a localised abscess. This is more likely with a delayed perforation than with an immediate one. In the former case a local peri-œsophageal protective barrier is formed which walls off the abscess cavity from the general para-œsophageal spaces. An abscess so formed may drain into the œsophagus with or without the foreign body in situ. Many observers (Kramer,[16] Tucker,[17] Imperatori,[18] Carmody,[19] Wright,[2]) have recorded cases of para-œsophageal abscess with recovery after endoscopic drainage. Cases have been described in which the entire foreign body had passed through the œsophageal wall and was later recovered from the abscess cavity. In cases in which the abscess cavity becomes shut off from the œsophageal lumen, in the cervical region, the head and neck may be held stiffly towards the affected side and signs of deep pus will become manifest. If drainage is not established the pus may track down into the thoracic portion of the para-œsophageal space.

A localised abscess resulting from a thoracic perforation may track up into the cervical region. Wright,[2] Lerche,[10] and Maclay [20] have reported cases of large para-œsophageal abscess, the two former were opened in the neck and the last in the second right intercostal space, and all recovered. More rarely the abscess may rupture into some portion of the respiratory tract. If this happens, tracheal or bronchial fistulæ may form or pyopneumothorax, pneumonia, pulmonary abscess, or bronchiectasis develop with their train of symptoms. Ballin and Saltzstein [21] report one personal case and quote six others of "transpleural œsophageal fistulæ." These were probably due to extrinsic causes rather than to foreign bodies, but all the patients recovered; and Chaubarrère [22] has recorded a similar case with spontaneous recovery. Orton [3] has reported a case which recovered—the only one out of a series of six—following aspiration of pus from the pleural cavity one month after the perforation.

These localised para-œsophageal lesions after resolution may give rise to fibrous stricture of the œsophagus.

The infection may lead to a generalised cellulitis of the para-œsophageal spaces. It has been stated that this cellulitis may resolve spontaneously and von Eicken [23] has quoted eight cases in which it subsided in this manner. In two other cases recorded, however, following spontaneous resolution, infective thrombo-phlebitis of the internal jugular vein in one (Mosher [24]), and a similar lesion of the azygos vein in the second (Kramer [16]) caused death. Usually a diffuse cellulitis goes on to extensive suppuration

FIG. IV.—A. Localised collection of air in the thoracic para-œsophageal space, displacing forward B, the barium-filled œsophagus.

throughout the spaces, which always leads to death by septicæmia.

Fulminating cases appear to be rare except in instrumental perforations, which are usually gross injuries frequently involving the respiratory tract, and accompanied by profound shock. Lyman Richards [25] has concisely and graphically described

the results of this accident: "Inside of four hours there is the tragic syndrome of grunting respiration, a tender abdomen, a high fever, and a rapid pulse, which to my mind portends an almost unavoidable tragedy." The foreign body itself may perforate directly into the respiratory tract causing signs and symptoms as described above.

Direct perforation into the aorta or big blood-vessels has been described. Thus Beal,[26] Linn,[27] Doria,[28] and Swain[29] have reported cases of direct perforation by swallowed foreign bodies into the aorta—all of them fatal. Secondary hæmorrhage from the aorta or big vessels may result either from an abscess of the para-œsophageal spaces with subsequent erosion of the vessel wall, or from the prolonged pressure of a smooth rounded object against the vessel. Ter-Oganesjan[30] has collected records of over fifty cases of hæmorrhage from the big vessels, and he reports five of his own.

Diagnosis

Œsophagoscopic diagnosis, except in eroded perforations, is inferential only. A foreign body may be seen actually piercing the œsophageal mucosa, or an abrasion or small punctured wound may be visible. It is, however, often impossible to form an opinion as to whether the entire thickness of the wall has been penetrated. With ulcerated wounds, a view of escaping pus or foul-smelling gas is patho-

FIG. V.—A, Widening of the post-tracheal space following injury by an upper œsophageal perforation.

gnomonic of perforation. Often the causal relationship of a swallowed foreign body can be presumed only, as it may not be found by œsophagoscopy, or indeed even if the case comes to autopsy. It is wise, therefore, to regard any wound of the mucosa with suspicion and to keep the patient under observation for a few days and to make frequent X ray examinations.

At present radiography is our most valuable means of diagnosis. Pancoast[31] has written that "it may be safely stated that abscess of the posterior upper food passage can in most instances be diagnosed roentgenologically before the usual clinical conclusions have been reached or the exact conclusions even suspected, . . . "; and this certainly holds good for perforations by foreign bodies. Thurstan Holland[32] in 1918 formulated a technique for the radiological diagnosis of the presence of non-opaque foreign bodies in the œsophagus. Barium sulphate paste of the consistency of thick cream is given to the patient and its passage through the pharynx and œsophagus watched under the fluorescent screen. The presence of a foreign body or an abrasion of the œsophageal mucosa may be suspected if one or more of the following points are noted: (*a*) "Hold-up" of opaque material. (*b*) "Hitch" of opaque material, usually associated with some regurgitation. (*c*) Retention of a trace of opaque material for 10–30 minutes after swallowing. (*d*) Retention of a trace of opaque material after swallowing water. (*e*) Division of the swallowed opaque food into two streams which reunite lower down. This occurs when a flat object lies across the lumen of the œsophagus. (*f*) "Hold-up" of a small piece of cotton-wool impregnated with barium sulphate paste.

If perforation of the wall has occurred in addition to the above, one or more of the following signs may be observed:—

(*a*) The presence of gas or air in the para-œsophageal spaces. Iglauer and Ransohoff[33] first drew attention to the X ray appearances of a bubble of air surrounding the point of a perforating foreign body in the cervical region; and the former[34] later stressed the diagnostic importance of the radiological appearance of air in the thoracic region. Such a collection of air in the thoracic para-œsophageal space is illustrated in Fig. IV. (Case 3).

(*b*) Displacement of the œsophagus. Fig. IV. shows forward displacement of the œsophagus; lateral displacement was also shown in the antero-posterior view of this patient (not reproduced).

(*c*) Increase of depth of the space between the bodies of the cervical vertebræ and the trachea. Hay[35] has published a table defining the limits of the normality of the width of this space for different ages. Fig. V. illustrates a widening of the post-tracheal space in a patient with a perforating foreign body of the post-cricoid region. This plate is of interest, also, as it shows "lipping" of the bodies of the lower cervical vertebræ—a factor which may have been contributory to the impaction of the foreign body.

(*d*) In the thoracic region by the presence of a tumour, probably sausage-shaped, in the para-œsophageal space. Since these notes were written Lawson Whale[36] has reported the post-mortem findings in a case of mediastinal abscess of unknown ætiology, and it is interesting to note that Dr. H. H. Sanguinetti describes this abscess as "shaped like a small curved sausage." Cases have been recorded in which opaque material has been observed to completely or partially fill a para-œsophageal abscess cavity.

(*e*) Widening of the mediastinal shadow in the antero-posterior view—as mentioned above this is probably due to inflammatory involvement of the endothoracic fascia.

(*f*) The passage of opaque material from the œsophagus into the tracheo-bronchial system or other part of the respiratory system.

(*g*) If a small quantity of lipiodol is swallowed the shadow of a streak of oil seen outside the œsophagus is proof positive of an œsophageal perforation (Iglauer[34]).

Prognosis and Treatment

It is impossible to estimate the frequency of foreign body perforations as numerous cases remain undiagnosed, but there is a wealth of evidence to prove the gravity of this accident.

Myerson[37] has reported seven cases of perforation of the cervical œsophagus of which four died; and one thoracic perforation which recovered. Lederer and Fishman[12] report two definite and one presumptive cases of perforations—all with recovery. King[38] reports six cases, four cervical and two thoracic, all of which recovered

Orton [3] reports six cases of para-œsophageal infection, five of which died. Wright [2] records three cases with one death, and the present paper three cases with one death.

Considering the œsophageal foreign body cases collectively, the mortality-rate varies very much. Schlemmer [39] reported 529 cases which had been treated in the period 1909–1919 with 15 deaths. Killian [40] reported 389 cases for the period 1900–1922 with 70 deaths. This high mortality is due probably to inclusion of the earlier years when endoscopic removal was in its infancy and comparatively unknown. Jackson [41] reported 204 cases for a period up to 1923 with 3 deaths. Iglauer and Ransohoff [33] from their investigations concluded that serious complications occur in about 3–2 per cent. of cases of foreign bodies in the œsophagus.

Opinions in regard to treatment vary very considerably, but from our very limited experience and study of the literature, the following would seem feasible: (1) Probangs, coin-catchers and all methods of blind bouginage should be abolished. (2) In all cases of *suspected* foreign bodies in the œsophagus, œsophagoscopy should be performed, even if X ray examination is negative. (3) Any case showing abnormality of the œsophageal mucosa should be kept under observation for a few days. No food should be given by mouth but administered per rectum. Repeated X ray examinations of such patients should be made. (4) Subcutaneous emphysema does not demand puncture unless there is evidence that it is followed by infection. (5) It is justifiable to attempt drainage of a para-œsophageal abscess due to an eroded perforation by endoscopic methods. (6) Known perforations with para-œsophageal emphysema but without general septic symptoms require no active treatment. They should be confined to bed and fluids should be given by the rectum ad lib. and nothing at all by mouth for three or four days. (7) Cases with known perforations and general septic signs must be treated surgically. They require gastrostomy, and if the perforation is: (*a*) Above the level of the fourth dorsal vertebra, the para-œsophageal space should be drained by a "cervical mediastinotomy" after the method of Furstenberg.[6] (*b*) Below the level of the fourth dorsal vertebra, a thoracic surgeon should be requested to drain through a posterior mediastinotomy.

Our thanks are due to Dr. Joseph Unsworth of St. Helens for his notes on Case 1 after her discharge from hospital.

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(*Continued at foot of next column*)

CHRONIC CONSTRICTIVE PERICARDITIS

(PICK'S DISEASE)

TREATED BY PERICARDIAL RESECTION*

BY PAUL D. WHITE, M.D. Harvard

FROM THE MASSACHUSETTS GENERAL HOSPITAL, BOSTON, MASS.

(*Concluded from p. 548*)

Groups A (cured cases), B (greatly relieved), C (dying primarily from the lesion itself) have now been detailed. There remain for consideration Group D (the cases who died of complications) and Group E (the living patients, in whom the diagnosis was made on clinical grounds and X ray evidence, but not proved by operation).

Group D.—CASES WHO DIED OF COMPLICATIONS

Case 11 died of otitis media, bilateral empyema, and acute pancreatitis a few days after pericardial resection, Case 12 died of chronic *Staphylococcus aureus* infection involving a pericardial sinus and lung abscesses one year after operation, and Case 13 died a few days post-operatively probably of true portal cirrhosis and the effect of posterior pericardial adhesions.

CASE 11.—L. A., male, negro, aged 18, entered the medical service of the Massachusetts General Hospital in August, 1930, acutely ill with a large pericardial effusion and slight fever. The heart sounds were distant; there were no murmurs. There was a markedly "paradoxical" pulse, the cervical veins were distended, and the liver was enlarged. During the course of the next three months the pericardium was tapped ten times and much bloody fluid was removed. Oxygen was injected after four of the pericardial paracenteses in the course of two months in the hope of preventing chronic constrictive pericarditis. This object, however, was not achieved, as will be seen later.

The patient was discharged home on Feb. 7th, 1931, much improved, and he resumed light activity. Shortly, however, swelling of the abdomen and dyspnœa on effort developed and he returned to the hospital. There, on April 16th, 1931, partial pericardial resection was performed by Dr. Whittemore; the patient was slightly but not satisfactorily improved. The microscopic section of the thickened pericardium which was removed showed the presence of tuberculosis. The patient was discharged

* The St. Cyres Lecture of the National Hospital for Diseases of the Heart, London, July 10th, 1935.

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with draining pericardial sinus to a tuberculosis sanatorium on June 26th, 1931.

After 11 months in the sanatorium and another few months of convalescence at home and in California he improved a good deal, but soon after this he began to notice the recurrence of dropsy.

He re-entered the hospital on Feb. 5th, 1934, and showed a completely healed anterior thoracic scar, a somewhat enlarged heart with good sounds and no murmurs, neck veins slightly distended, a "paradoxical" pulse, and a blood pressure of 108 mm. systolic and 80 diastolic. There were enlargement of the liver (edge felt four fingers-breadth below the costal border), slight ascites, and moderate œdema of the legs. His serum protein was 4·1 per cent.

The X ray examination showed some increase in the heart shadow and in the supracardiac shadow. There was evidence of partial fixation of the heart, more marked on the right than on the left.

The electrocardiogram showed normal rhythm, rate 70, with low voltage, and low T waves in all leads.

The urine was negative, and blood examination showed leukocytosis 12,000 to 18,000 with no anæmia. The Hinton reaction was negative.

Further surgery seemed indicated, and on Feb. 23rd, 1934, a long incision was made mediate to the old incision extending out toward the axillæ. The sternal muscle flap was turned up and some sternum removed, and also some cartilage of ribs. The pericardium was found very thick and adherent to the heart. Several large sections of the pericardium were freed from the heart and excised, more on the left than on the right. The pericardium which was removed showed fibrosis.

Two weeks after the operation the patient seemed definitely improved. The abdomen was smaller. He had less dependent œdema, and he felt more comfortable. There had been slight spontaneous diuresis for ten days beginning the third day after operation. There was a loss of 5½ lb. in weight as a result of the diuresis. The day after discharge from the hospital he developed a left earache, followed by fever and chills. An acute otitis media had to be treated by incision. Following this there were severe pain in the left flank, nausea, and vomiting, and he was readmitted to the Massachusetts General Hospital very ill on March 16th. He died on March 22nd, 1934, and post-mortem examination showed a bilateral empyema with acute pancreatitis, subsiding left otitis media, chronic tuberculous adhesive pericarditis, cardiac cirrhosis of the liver, ascites, and peripheral œdema.

CASE 12.—Miss H. E. P., female, aged 31 at the time of her admission to the Massachusetts General Hospital, August 5th, 1930. Her past and family histories were of no importance. In 1928, two years before admission, she had an abscess in the right ear followed by severe earache and mastoid pain. There was a discharge for several months from that ear. Soon after the onset of this ear trouble she noticed dyspnœa on exertion, palpitation, and œdema of the ankles at night. For the ear condition she entered the Eye and Ear Infirmary twice, the second time in February, 1930, at which time anæmia was found and treated. Her tonsils were removed in June, 1930. On getting up from bed after this operation she noted an increase in dyspnœa and œdema with some swelling of the abdomen. She was put back to bed, given digitalis, and also treated for a moderate secondary anæmia.

She improved at first but then her symptoms recurred and she entered the Massachusetts General Hospital on April 10th, 1931. Examination showed some cyanosis, increased jugular venous pulsation, no increase in cardiac area to percussion, fair heart sounds with third sound at the apex, dullness at the right lung base, enlarged liver as before, and atrophy of the arms and legs. There was little evidence of ascites. The blood pressure was 120 mm. systolic and 80 diastolic. The pulse was regular at about 90. There was very slight fever, at times up to 99 and 100° F. The blood showed as before secondary anæmia but less severe. There was an occasional leukocytosis. The urine was not remarkable. By chest tap clear straw-coloured fluid was obtained with a specific gravity of 1·018. This fluid was negative for tuberculosis on guinea-pig inoculation. X ray showed slight increase in the width of the heart shadow and calcification of the pericardium forming a definite ring from the region of the pulmonary conus down to the diaphragm. The left auricle appeared to be enlarged. The interlobar septum was visible on the right. There was evidence of a small amount of fluid at the right base.

The electrocardiogram showed auricular premature beats interrupting normal rhythm at a heart-rate of 100 with low voltage and low T waves.

The venous blood pressure was 15 cm.

On April 29th, 1931, she was transferred to the surgical service for decortication of the heart by pericardial resection by Dr. Whittemore. Parts of the fourth, fifth, sixth, and seventh costal cartilages and the edge of the left border of the sternum in this region were removed. The pericardium was opened through a calcified area. In one place there was a small collection of thick, white pus. Culture of the pericardial pus showed no growth and no organisms were seen in the smear. With considerable difficulty a line of cleavage was made between heart and pericardium, and a considerable portion of the anterior pericardium was removed with rongeurs. The apex was free. There was considerable bleeding from the removal of the calcified pericardium in the region of the diaphragm. This was controlled with a gauze pack. The pericardium which was removed showed fibrosis and numerous large foci of calcification. There was no evidence of tuberculosis.

Following the operation the patient seemed more comfortable, and was able to move about more freely. Because of the finding of pus at the time of operation a wick was left in the operative wound, and the sinus continued to drain freely. She showed occasionally a slight fever, but no leukocytosis. She was discharged to a convalescent home on June 11th, 1931. She was readmitted to the hospital on June 28th, 1931, because of chills and fever, pain in the lower left chest, and persistence of the post-operative pericardial sinus. Her general condition was much the same as before. Culture of the pus from the sinus was positive for *Staphylococcus aureus*. The smear showed gram-positive cocci, but no tubercle bacilli. The sinus was discharging thick green pus. During the next few months her condition remained essentially unchanged, but gradually through the winter she grew weaker with increasing symptoms of pulmonary trouble, and died on April 18th, 1932.

Autopsy showed fibrous pleural adhesions in both chests with two abscess cavities in the right lung, thick calcified pericardium extending in places into the myocardium, and a draining pericardial sinus. The heart was slightly enlarged without dilatation. The mitral ring showed slight calcification. The tricuspid orifice was almost occluded by a ball thrombus, attached by a small pedicle to the wall of the right auricle.

CASE 13.—J. A. H., male, 52, a shoe worker, began to notice shortness of breath on effort in January, 1932. In July, 1932, swelling of the ankles began. In September his œdema had reached the thighs, and he was hospitalised for five weeks. At Christmas time he had the grippe. Pleural effusion developed and in February each pleural cavity was tapped with the removal of much straw-coloured fluid. He showed some asthmatic wheezing after each tap. Chest taps were continued from April, 1933, at the rate of about one a week until his entrance to the Massachusetts General Hospital on Sept. 23rd, 1933. He lost strength steadily over this period of time, but the œdema of his legs subsided somewhat. His past history was entirely unimportant. He had tonsillectomy eight years before, after tonsillitis. Family history was unimportant. Physical examination on admission to the Massachusetts General Hospital on Sept. 22nd, 1933, showed a well-developed and nourished man, slightly dyspnœic, but in no great discomfort. The cervical veins were engorged and pulsating, with his head and neck at an angle of 45°. The cardiac apex impulse was poorly felt. Percussion dullness was slightly increased. The heart rhythm was absolutely irregular, and the rate was 60. The blood pressure was 104 mm. systolic and 60 diastolic. There were a moderately loud blowing systolic murmur and a loud third sound at the apex. The pulmonary

second sound was slightly accentuated and reduplicated. There were no diastolic murmurs. The pulses were small. There was dullness to flatness below the angle of the right scapula and at the extreme left base, with diminished breath sounds and slight pleural friction rub at the right base. There was slight œdema over the lower back and of both legs up into the thighs. There was moderate ascites. The liver edge was palpable, five fingers-breadth below the costal margin; it was not tender.

Fluid which was obtained from abdominal and pleural cavities was evidently a transudate. When inoculated into a guinea-pig, the abdominal fluid was negative for tuberculosis.

The urine showed slight albuminuria. The blood was normal except for slight secondary anæmia. The serum protein measured 5·3 per cent. The Wassermann reaction was negative

X ray examination showed extensive calcification of the pericardium, especially in a circular region from the pulmonary artery downward to the diaphragmatic surface of the heart and transversely to the midline. Pulsation of the heart was not evident except at the apex where it was quite distinct. There was considerable fluid in both pleural cavities.

The electrocardiogram showed auricular fibrillation with a ventricular rate varying from 60 to 110, and markedly low voltage with inverted T waves in Leads 1 and 2.

After observation in the ward over a period of ten days this patient was transferred for operation, and on Sept. 30th, 1933, Dr. Churchill performed pericardial resection. The pericardium was found greatly thickened and calcified, particularly over the right ventricle. The line of cleavage was established over the left ventricle, and the pericardium was freed around the apex at the left side of the heart. With considerable difficulty the calcified pericardium was removed from the right ventricle and the diaphragmatic pericardium was resected down to the vena cava. There was a stormy post-operative course with pulmonary œdema. Both pleural cavities were again tapped, the right on Oct. 3rd and the left on the 4th. He died suddenly on Oct. 5th.

Post-mortem examination showed chronic adhesive pericarditis with calcification, especially posteriorly, but without evidence of tuberculosis, acute and chronic bronchitis and slight broncho-pneumonia, pulmonary œdema, slight right hydrothorax, chronic fibrous bilateral pleuritis, marked cirrhosis of the (liver of the chronic portal type, not of the lesser degree associated ordinarily with cardiac cirrhosis), perisplenitis, cholelithiasis, ascites, and peripheral œdema.

Group E.—LIVING CASES NOT PROVED BY OPERATION

Two living cases were not proved by operation but by characteristic signs and X ray evidence of pericardial calcification.

CASE 14.—W. J. B., a physician in general practice, aged 57 years, consulted me, Jan. 4th, 1930, with the following history.

He had had "dry pleurisy" in 1894 while studying medicine. Closely following this there was fever with enlargement of the liver and neck veins which persisted for several months that summer. The legs were also slightly swollen. He resumed his studies and improved slowly so that he lost his œdema, but his liver remained somewhat enlarged. From 1896 to 1916 he carried on a vigorous country practice with little limitation, but some dyspnœa on climbing stairs. In 1916 he had a respiratory infection followed by some congestion of his liver and legs. He improved, but again the next year, 1917, he had influenza, and after that serious congestion from which he gradually recovered in the course of a year. He resumed work in 1918. In 1922 he began to have paroxysms of very irregular tachycardia lasting several days and recurring every two or three months. He took some digitalis for this. The attacks decreased gradually in frequency so that in 1927 and 1928 he had only five or six paroxysms altogether. At Christmas time in 1928 he had another respiratory infection and this was followed by constant cardiac arrhythmia. In April, 1929, his wife died suddenly, and following this shock he was forced to go to bed, and had acute congestion lasting three months. With rest and digitalis he had slowly improved up to the time of his visit to me. On examination I found him well developed and nourished with the following abnormalities; slight to moderate fullness of the arm and neck veins, heart very slightly enlarged in size with a loud third sound at the apex (there were no murmurs), very irregular heart rhythm with a rate of 75, and the liver enlarged with a non-tender edge felt two fingers-breadth below the costal border. There was no evidence of ascites or œdema of the shins. The lungs were clear. The blood pressure was 115 systolic and 85 diastolic. The electrocardiogram showed auricular fibrillation with a ventricular rate of 70 to 80, and low T waves. Fluoroscopic examination showed the heart somewhat enlarged, and somewhat fixed, with areas of pericardial calcification, especially at the left upper and inferior borders of the heart.

Pericardial resection was not advised, because of his age and relatively slight incapacity. On Oct. 22nd, 1930, he was examined again and showed no changes. On June 8th, 1932, he wrote of his reasonably good health with the same signs as before. He was carrying on a light practice.

CASE 15.—Mr. A. B., Jewish tailor, aged 45 years. He had always been well and active except that for a number of years he had noticed gradually increasing shortness of breath. In the summer of 1930 because of chronic constipation and heart-burn he went to a local hospital for study. There he was told that he had an abnormal heart condition. He returned home improved. In the fall of 1930 he had much increase in dyspnœa on exertion with a feeling of weakness, and stopped work. In the summer of 1931 he began to develop swelling of his ankles and abdomen and had some aching pain in his precordial region. He contracted a cold and sore-throat which caused him much discomfort and a troublesome cough. His physician told him that his heart was very bad, and gave him digitalis. In January, 1932, the swelling of his ankles increased and he had to sleep with his head high at night. His coughing was continuous. Early in February, 1932, he fainted and thereafter was sent to bed; shortly after this was referred to me for study and entered the Massachusetts General Hospital. The past history revealed no illnesses except for influenza in 1918 and 1920. The family history was not remarkable.

Physical examination showed a well-developed and nourished man, moderately dyspnœic, with slight cyanosis. His voice was hoarse. His tongue was slightly coated. His cervical veins were engorged. His tonsils were moderately enlarged. The heart was slightly enlarged. The sounds were fair, the pulmonary second sound accentuated. There were no murmurs. There was no Broadbent's sign. The heart rhythm was absolutely irregular. The pulse was small. The apex heart-rate was 130. The rate at the wrist was 100. The blood pressure was 115 mm. systolic and 90 diastolic. The lungs showed emphysematous breathing throughout with scattered coarse râles, and slight dullness at the right base. The abdomen was distended, the liver much enlarged. There was a considerable amount of ascites, but there was no œdema over the shins. Fluoroscopic examination showed moderate enlargement of the heart, especially at the left upper border with increase in the lung hilus shadows and pericardial calcification, easily seen about the apex in the right anterior oblique position. The electrocardiogram showed auricular fibrillation with a ventricular rate of 130 and diphasic S–T intervals in Leads 2 and 3. The voltage was rather low. The urine was normal. The blood was normal. The Hinton reaction was negative. The venous pressure was 21·5 cm.

He improved in the course of the next three weeks after digitalisation. His heart-rate dropped to 80. His liver decreased somewhat in size. The ascites and right hydrothorax disappeared. His neck veins remained only slightly engorged. His cyanosis was considerably less.

This improvement did not continue for long and in spite of constant digitalis therapy he was in a poor state of health when examined in September, 1934, with increas-

ng dyspnœa, small pulse pressure (110 mm. systolic, 90 diastolic), big liver, and dropsy (slight ascites and slight œdema over the shins). Pericardial resection was considered but not done; he was by no means an ideal case for it.

Diagnosis

I shall now summarise our experience with these 15 cases of chronic constrictive pericarditis so far as it applies to the diagnosis of the condition. Twelve of the cases were proved by operation, one other by autopsy, and the remaining two by clinical evidence and X ray. Several other probable cases that I have seen I have not included.

Sex.—Nine of the 15 cases were males and 6 were females.

Age.—The ages of the individual cases at the onset of their trouble ranged from 5½ to 50 years, and at the time of operation from 11 to 52 years; at the time of the last follow-up note they were as follows: Well at 11, 14, 14, 21, 25, and 32 years. Much improved at 20. In mediocre health at 48 and 60. Dead at 22, 23, 32, 32, 36, and 52 years. Our oldest case successfully operated upon was in her thirty-first year.

Race.—Six of the 15 cases were of English stock, three French-Canadian, two Irish-American, one German-American, one Polish-American, one Jewish-American, and one Negro-American.

Cause.—The ætiology of the chronic pericardial disease can be assigned as follows: tuberculosis in two (questionable in two others), pneumonia with polyserositis (including both pleuritis and pericarditis) in two, sepsis in one, rheumatism in none, uncertain or unknown in ten (in five of which, however, there was a definite history of acute pericarditis). The absence of the rheumatic infection as an ætiological factor in our series is striking and is a distinct contradiction to frequent statements in the literature, even by present-day authorities, which are based as a rule on little or no personal experience or on cases not strictly belonging to this group, that is, on cases whose symptoms and signs are primarily due to valvular or myocardial disease or on cases in whom external pericardial adhesions are playing the preponderant rôle. It is of further interest that a series of 1000 children with the rheumatic infection studied at the House of the Good Samaritan in Boston, and followed over a period of ten years has shown in not a single instance any evidence of chronic constrictive pericarditis, even though the heart was often seriously involved in other respects and even though acute pericarditis had been noted in many cases during their acute rheumatic infection. Certainly, therefore, if rheumatism can cause Pick's disease it does so in only the rarest cases. As a matter of fact Chevers [9] had pointed this out in 1842.

Symptoms.—The first symptoms were dyspnœa in four cases, abdominal enlargement (that is, a big liver and ascites) in three, dyspnœa and abdominal enlargement in three, œdema of the feet and abdominal enlargement in two, œdema of the ankles in one, œdema of the face and abdominal enlargement in one, and soreness in the right upper quadrant in one. In all cases abdominal enlargement was present at some time during the illness; it was the only uniform symptom, but swelling of the feet and dyspnœa at some time or other also occurred in most of the cases. There was little pain or palpitation. Weakness was occasional. Some patients showed loss of weight in the upper part of the body. There was no fever except in two patients with subacute tuberculous infections and in several cases during intercurrent acute infections. In several cases it was clear that the symptoms of acute pericardial involvement passed over into those of chronic constrictive pericarditis.

Signs.—Two signs were consistently present in all cases: (1) *enlargement of the liver*—non-tender and non-pulsating—usually *with much ascites*, and (2) *engorgement of the jugular veins* with or without evident pulsation. The venous pressure when measured before operation was usually between 20 and 30 cm., three times or more the normal.

The reason for the preponderance of liver enlargement and ascites in the dropsy of the majority of cases of chronic constrictive pericarditis is probably to be found in the greater obstruction of the flow in these cases from the hepatic veins at or near their outlet into the inferior vena cava than of the flow in the vena cava itself. Such obstruction may be due to the pressure of locally constricting adhesions, or of fluid (as in acute pericardial effusion), or to anatomical variations in the venous relationships. Much further study of this problem is needed. It is to be noted in this connexion that dependent or generalised œdema antedated or overshadowed the liver enlargement and ascites in a few of our cases.

The *size of the heart* was normal in seven cases, slightly enlarged in five, and moderately enlarged in three. In at least some of the cases with apparent slight enlargement the thickness of the fibrosed pericardium itself could account for the increased measurements by X ray or physical examination. There were no *heart murmurs* in 12 cases; systolic murmurs, slight to moderate, were heard at the apex in the other three. There were no diastolic murmurs. The heart rhythm was normal in 11 cases, except for some extrasystoles in one; in the remaining four cases there was auricular fibrillation.

The *blood pressure* and *pulse pressure* were low in 11 of the 15 cases and low normal in the other four. In seven cases a well-marked "*paradoxical*" *or Griesinger-Kussmaul pulse* was noted, in two cases it was said not to be present, and in the remaining six cases it was apparently not looked for.

Broadbent's sign [6] was noted in no case, nor was inspiratory collapse of the neck veins; Friedreich [17] in 1864 had called attention to the presence of this latter sign in two cases of adhesive pericarditis, but it is important to note, as he himself stated, that the cause of this sign is in the action of external adhesions, and *not* from the effect of a constricting pericardium. There was *effusion into the pleural cavities*, in the nature of a transudate, in seven of the cases, generally in the sicker patients, and in one other case there was a terminal empyema.

Œdema of the legs was present in 10 of the 15 patients, being marked in four. The abdominal and thoracic walls were œdematous in seven patients and the face was swollen in two.

In no case was the spleen felt definitely.

X ray.—The heart shadow was normal in size by X ray in seven of the cases and slightly to moderately enlarged in the remainder. The shape varied greatly from normal to so-called mitral with prominence of the left upper border, and in three cases there was indication of left auricular enlargement (two of these patients had auricular fibrillation). The amount of pulsation present varied widely from fairly free on both sides to little or none anywhere. It was quite a common finding to observe free pulsation at the cardiac apex and left border with no pulsation at the right border (which would extend a little too far to the right with a hazy outline). In most cases there was an increase in the supracardiac shadow, appar-

ently due to dilatation of the superior vena cava and to mediastinal involvement or displacement. The lung hilus shadows were increased in over half the cases (nine). In several (six) a clue was presented by the finding of considerable pleural thickening. The heart itself was more or less anchored in six cases, with or without restricted movements of the diaphragm on one side or the other. Pericardial calcification was noted by X ray in six of the 15 cases, but before operation in only three of the 12 cases that were operated upon. The presence of calcification is a helpful confirmatory sign, but it is usually absent, and when present it does not mean Pick's disease if there are no other evidences —pericardial calcification by itself does not indicate the need of surgery.

Electrocardiography.—Much help has come from the electrocardiogram, especially in doubtful cases. In all of the 14 cases electrocardiographed the record was abnormal in one of two respects: there was either low voltage (in five) or inversion or flattening of the T waves in Lead 1 or Lead 2 or both leads (in ten) —in one case both these anomalies were present. The inversion of the T waves was of the so-called coronary type, like that also found in many cases of acute pericarditis. The heart-rate varied widely. Normal rhythm was the rule, but auricular fibrillation was present in four of the 15 cases. It is of interest that the electrocardiographic abnormalities may persist in whole or in part after operation, even in the cured cases—in fact a complete return to normal has, in our small series of cases, occurred once only, namely in Case 4, in which after operation the electrocardiogram was perfectly normal. The reasons for the occurrence of the abnormalities and for their persistence are still obscure.

The *blood* frequently showed slight anæmia and usually but not always a low serum protein. A frequent figure for the serum protein was 3·5 to 4·5 milligrammes per cent. with increase after the correction of the trouble. The lower readings were found in the more chronic and sicker patients and were dependent probably on the combination of general malnutrition and the loss of protein in the ascitic fluid.

The *liver function* was sometimes slightly reduced. The urine was generally normal.

Differential Diagnosis

In the differential diagnosis of chronic constrictive pericarditis the following conditions must be taken into consideration, arranged in order according to their likelihood of confusion: mitral stenosis, polyserositis, cirrhosis of the liver, nutritional or other œdema, mediastinal tumours, tricuspid valve disease. According to my experience only the first four named conditions are likely to be confused with chronic constrictive pericarditis.

Mitral stenosis is to be differentiated by the finding of its characteristic diastolic murmur at the cardiac apex, in the absence of a severe active rheumatic infection. The presence of mitral stenosis may be taken at once as ruling out chronic constrictive pericarditis of any serious grade. Two cases have been sent to me in the last year for consideration of pericardial resection who showed on careful study mitral stenosis, confirmed at post-mortem examination; we recognised clinically the true state of affairs and so did not operate on these cases. The error in diagnosis had resulted from the finding of chronic preponderant abdominal enlargement (big liver and ascites) with engorgement of neck veins plus the failure to discover the characteristic diastolic murmur of mitral stenosis. The error of omission in these cases was due to the fact that auscultation had not been practised in exactly the right spot, that is, at the cardiac apex which happened to be far out in the anterior axillary line. The very fact that the heart was much enlarged in both these cases was in itself sufficient to rule out the diagnosis of chronic constrictive pericarditis as the fundamental condition.

Polyserositis.—A very common misunderstanding has been to confuse polyserositis with Pick's disease; mixed up in this confusion has been a general erroneous viewpoint concerning perihepatitis or iced or frosted liver (Zuckergussleber of Curschmann).[12] Polyserositis, or an inflammation of several serous cavities, sometimes called Concato's disease,[11] is occasionally found in young individuals, due to tuberculosis, associated with pneumonia, or, most commonly of unknown cause. The pleuræ and pericardium are the serous cavities generally involved, but sometimes the peritoneum is also affected. The infection begins as an acute process, sometimes insidious and obscure with little clinical evidence and sometimes severe and easily diagnosed; it goes on to a chronic fibrous state of varying importance. Polyserositis is not Pick's disease, although it may be the infection that precedes it in some cases. Neither is Pick's disease polyserositis, although the two frequently coincide. Chronic pleuritis of considerable degree occasionally accompanies chronic constrictive pericarditis, as does also chronic peritonitis. Perihepatitis resulting in the frosted or iced liver (Zuckergussleber), first clearly discussed by Curschmann,[13] may or may not be found in Pick's disease; it is not a necessary part of the disease. If there has been enough peritonitis during the polyserositis that may precede Pick's disease, then the liver may become frosted, or the spleen, or even the intestines, but in our series of cases among six whose livers were seen at necropsy (four patients) or at operation (omentopexy in two patients) there was chronic perihepatitis (icing or frosting) in none, that is, the liver capsule happened to be smooth and relatively thin in all, even though the liver showed considerable nodular fibrosis in one of them and was slightly nodular in two others. The most common site apparently for the chronic peritonitis is the under surface of the diaphragm; this was found in two of the six cases mentioned above (one at post-mortem examination and one at operation.) There has arisen a question as to the possible influence of the blocking of the lymphatic flow in that region to help to explain the persistence of the ascites in some cases. Perihepatitis, perisplenitis, and even frosting of the intestine itself may occur quite independently of pericarditis or pleuritis; they may be found associated or as isolated lesions.[4]

Portal cirrhosis of the liver should be easily distinguished from chronic constrictive pericarditis in nearly every case. The relative youthfulness of the patients with Pick's disease, their absence of a history of alcoholism or serious infection or other factor pointing to cirrhosis of the liver as the chief lesion, their small often "paradoxical" pulse with low pulse pressure, and particularly the apparently conclusive finding of increased pressure in the neck veins quickly distinguish them from cases of primary cirrhosis of the liver. The changes in the liver in most cases of chronic constrictive pericarditis are relatively slight and consist of vascular congestion plus the so-called cardiac cirrhosis, fibrous strands radiating from the central veins towards the interlobular spaces. The more chronic severe cases show a larger amount of this fibrosis, but not the degree of liver damage

seen in primary cirrhosis of the liver. One of the five cases of our series (Case 13) whose liver tissue was examined, showed a high degree of cirrhosis which our pathologist (Dr. Tracy B. Mallory) believes to have been largely independent of his chronic constrictive pericarditis and to have been an important factor in hastening his post-operative death. His age was 52 years. Two other cases, a man (Case 11) and a woman (Case 12) both with severe symptoms and signs of chronic constrictive pericarditis over an interval of several years, showed a considerable degree of liver fibrosis, probably the result of an advanced chronic constrictive pericarditis. Most of the cases have some slight reduction of liver function as shown by special tests (such as with Rose Bengal or bromsulphalein), but not the high degree of dye retention found in the presence of jaundice or in a few cases of severe portal cirrhosis of the liver.

Nutritional œdema is easily distinguished from chronic constrictive pericarditis. It presents quite a different picture save for the generalised œdema, which may occur in some cases of Pick's disease, and the lower serum protein (below 5 per cent.) also found in some cases of Pick's disease, particularly in those with chronic malnutrition. The increased venous pressure, preponderant liver enlargement, and course of the illness quickly label as such the patients with chronic constrictive pericarditis.

Prognosis

The prognosis of Pick's disease without surgical treatment is unfavourable for health and in some cases for life. It tends to be a chronic disease, lasting several to many years, and often remaining at a standstill for long intervals of time. In a few instances as in several of our series, the downhill course may be rapid, ending in death from the disease itself or from complications in the course of months or a year or two. Remissions may occur, especially if favoured by therapy such as rest, diuretic drugs, and fluid and salt restriction, as pointed out in his own noted case by Finsen[16] 35 years ago. Spontaneous cure probably does not exist; surgery affords the only real cure, which in our experience has been effective for at least seven years.

The occasional cases of apparent recovery for intervals of months or years after the occurrence of symptoms and signs of cardiac compression before a recurrence of persistent symptoms and signs of much the same sort are undoubtedly to be explained as having had, at first, an acute pericarditis with effusion which subsided, and later on, after healing, constriction from a chronically contracted fibrosed pericardial sac (with or without calcification, which is in large part incidental).

Treatment

The so-called *Delorme operation*,[14 32] of pericardial resection is the only cure for chronic constrictive pericarditis or Pick's disease. It is evident that Brauer's simple operation[5] of removal of ribs over the heart, once called cardiolysis but better designated thoracolysis, cannot help in the least in freeing the heart from its shell of fibrous pericardium, although this operation may be useful in rare cases where there are important external adhesions glueing the heart to the chest wall itself, or in patients with very large hearts which raise the ribs in systole and not only increase their work thereby but cause much precordial discomfort.

There are four essentials for a successful operation of pericardial resection: (1) the evaluation of symptoms and signs that makes the diagnosis certain, (2) the selection of a case that is more or less crippled and yet a reasonable risk for the extensive operation that is necessary, (3) an expert anæsthetist (our cases have had general anæsthesia under ether), and (4) an experienced thoracic surgeon who is bold and yet cautious, who will do enough to free the heart and yet not too much to endanger the patient's life. It is possible to operate more than once to free adhesions and in at least one case on record the posterior surface of the heart has been successfully decorticated in a second operation after the anterior surface of the heart had been freed in a first operation. The commonly expressed fear that constricting adhesions once removed may reform has proved entirely groundless not only in our experience at the Massachusetts General Hospital but in that of others, in the absence of an acute or subacute pericarditis. When a second operation has been done at the site of an early resection the approach to the heart has been easy and rapid, only unimportant non-constricting adhesions having developed; the border of the unresected thickened constricting pericardium is easily identified.

THE STEPS OF THE OPERATION

In brief, the operation,[10] under ether anæsthesia, consists of the exposure of the pericardium and heart by the removal of the fourth, fifth, and sixth left costal cartilages and rib ends by costotome, and of the left part of the sternum by a special knife. The left pleura is identified and retracted; it is frequently adherent and sometimes extends unusually far to the right. The left border of the right pleura underlies the sternum and must also be looked for prior to beginning the pericardial dissection in that region. When the pericardium is reached it is scrutinised and opened at the most favourable point. In some cases there are only slight adhesions at the cardiac apex or along the left heart border or elsewhere, and the sites are then to be selected for the beginning of the dissection; in other cases the pericardium is closely adherent and calloused or even calcified over the entire surface of the heart, and then the dissection may begin in any convenient area, and may be continued more or less radially. It is best, so far as it is possible, to free the left heart chambers before the right, so that there may not be a flooding of the pulmonary circulation when the right chambers are freed first while the left chambers remain constricted.

The vital part of the operation—that is, the decortication of the heart—begins after about an hour's preparation of the field. Both blunt dissection and sharp dissection are used to free the heart itself from the constricting pericardium, which may be thick tough parietal pericardium, dense epicardium, or both securely or even inseparably united. Sometimes a line of cleavage is easily found but often it is not and one must then use great care to avoid splitting the muscle itself and entering one of the heart chambers, the right ventricle or right auricle in particular. However, even if the heart is penetrated the wound may be quickly repaired, as happened in two of our own successful cases (Cases 2 and 5); leaving a strip of pericardium attached to the heart as one dissects permits its use as a patch of tissue to suture over the wound. The thickened, or even calcified, pericardium is cut away in rather small pieces (averaging about 1 to 4 square c.cm. in area) while the dissection is in progress. In the usual course of operation the cardiac apex, the anterior surface of the right

ventricle, the anterior surface of the right auricle, as much of the diaphragmatic surface of the heart as can be reached, and the inferior and superior venæ cavæ are freed so far as possible, in the order named. The dissection takes about an hour. The thoracic muscles and overlying tissue and skin are then sutured in place over the heart, and the patient is returned to bed to remain under an oxygen tent for as long as may be deemed necessary. My colleague, Dr. E. D. Churchill, plans to publish the details of his operative experience in these cases. Without his invaluable assistance I could not have so quickly collected data from proved cases relative to the diagnosis of chronic constrictive pericarditis. I take the greatest pleasure in acknowledging my indebtedness to him.

Two methods of treatment of chronic constrictive pericarditis which should be discarded because of their ineffectiveness, evident both in theory and practice, are: (1) digitalis therapy, and (2) omentopexy or the Talma operation.

Summary and Conclusion

A study of the literature and an analysis of a series of fifteen personal cases of chronic constrictive pericarditis, or Pick's disease, have shown that in the diagnosis one should take into consideration not individual signs alone but the entire clinical picture and history of the case. The leading clues are the result of "inflow stasis," namely, (1) the insidious onset of dropsy in a young person, (2) preponderant liver enlargement and ascites, (3) increased prominence of the jugular veins, (4) normal or relatively normal heart in the presence of dropsy without nephritis, and (5) low blood and pulse pressure and paradoxical pulse. Other important clues are (6) X ray evidence (poor pulsation, calcification, chronic pleuritis), (7) electrocardiographic abnormalities (low voltage or "coronary" T waves in chronic disease in early youth), and (8) a previous history of acute pericarditis or polyserositis.

Chronic constrictive pericarditis has been confused with four other conditions, but with ordinary care and thought such errors of diagnosis should not arise. The four conditions are mitral stenosis, polyserositis (including instances of perihepatitis or frosted or iced liver—Zuckergussleber), primary cirrhosis of the liver, and nutritional œdema. Two other conditions—namely, tricuspid stenosis and mediastinal tumours—may also cause some of the same signs.

The prognosis of cases with chronic constrictive pericarditis for good health is poor unless suitable for, and submitted to operation, although mild or only moderately severe cases may live for many years a semi-invalid life requiring much rest and frequent or occasional abdominal paracenteses.

Cure is now possible by surgery and an imposing number of successful cases of pericardial resection (by the Delorme operation, and not by that proposed by Brauer) is being accumulated. In our own clinic twelve cases have had this operation performed, ten by one surgeon; of these latter ten cases, six have been completely cured and one other relieved to a high degree. The first successful case in America, operated on seven years ago in 1928,[10] belongs to this group; this patient, a young woman, is in excellent health to-day, as are the other five cases of complete cure.

In closing, I would emphasise, that these are but progress notes; much yet remains to be learned about this important subject, but the obscurities are certain to yield to a richer experience.

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KENT AND SUSSEX HOSPITAL.—A sum of £15,000 is needed to wipe off the debt on the building fund of this hospital. There is an average of 190 patients in the wards and a waiting-list for more. The total receipts for the half year were £12,400, and expenditure was £13,726.

THE TREATMENT OF OBESITY*

By John H. Anderson, C.M.G., C.B.E., M.D. Melb.
PHYSICIAN, RUTHIN CASTLE, NORTH WALES

Obesity is a symptom, not a disease, and the first step in its treatment is to determine whether the main causative factor is exogenous or endogenous. In most cases of obesity, and always in those of exogenous origin, food intake exceeds energy output and the rational line of treatment is to decrease food and increase muscular activity. Endogenous obesity calls for substitution therapy, for the governing defect in metabolism arises from dysfunction in some part of the endocrine system, notably the thyroid, pituitary, or sex glands. Mixed types, possessing both exogenous and endogenous features, are numerous and require a combined line of therapy. It is necessary at the onset therefore to take a careful history, with especial reference to the patient's habits of life, food, and exercise and the occurrence of obesity in close relatives. A full clinical examination should also be made, reinforced where possible by laboratory tests, particularly a sugar-tolerance curve, an estimation of the basal metabolic rate, and a radiological examination of the pituitary fossa. In each case there is, in my opinion, a second important point to be decided if treatment is to be successful. Is the patient healthy, apart from the temporary impairment of function due to fat infiltrating or accumulating on vital organs, or is there a lowering of general efficiency due to associated disease in other systems, particularly the circulatory and the respiratory? The two following cases illustrate this point.

A man in the sixties whose business forces him to lead an unhygienic life as regards food and exercise has paid several visits to Ruthin Castle in the last few years. Apart from his overweight he is in good condition and so can stand strict diet and vigorous exercise. In 183 days of treatment he has lost 168 lb. in weight, an average daily loss of 0·9 lb. Weight has been regained between treatments and he is now 12 lb. heavier than when first seen, though he has lost just 12 st. under treatment in the intervening period. He belongs to what I would call the "healthy or simple" obesity type.

Another man of about the same age was admitted with fibrositis, brachial neuritis, a blood pressure of 200/100, marked glycosuria, and a blood-sugar ranging from 0·18–0·24 per cent. His weight was 12 st. 7 lb. and under treatment it fell 14 lb. in five weeks, an average daily loss of 0·4 lb. On leaving, the blood pressure was 160/90, the blood-sugar 0·13–0·14 per cent., and he was free from pain in the arm and sugar in the urine. This patient typifies "unhealthy or complicated" obesity.

Treatment was on the same general lines in both cases but there was difference in detail, particularly as to rate of reduction, and in each case the final result was satisfactory.

It is the failure to recognise the possible association of obesity with lowered bodily efficiency and resistance that leads to unwished-for results and even tragedy. This is seen where loss of weight is too rapid and in the reduction often carried out by patients themselves, without proper supervision and by unsuitable means. For example, a man nearing seventy who was bronchitic and arthritic as well as obese, was treated elsewhere, with strict diet, internal and external douchings, purgation, and massage. He lost 2½ st. in under a month, but was laid up most of the next four months with his joints and chest, and when he had "recovered" from his "cure" found to his disgust that he had regained most of the lost weight. We found that it was possible to produce more permanent results by less drastic methods. It is to be noted in passing that the weight lost in these rapid reductions is almost as rapidly regained. If the patient is to remain well he must acquire a mode of life, particularly as regards food, which will enable him to keep his appetite and so his weight within bounds. This takes time and too rapid reduction often defeats its own ends. In the great majority of the cases, with which we as medical practitioners have to deal, reduction is not undertaken with a view to producing spectacular results as shown by a weighing machine, but to increase the efficiency and well-being of our patients. Obesity has been described as falling into three grades according to its severity—the enviable or regal, the comical, and the pitiable. Our duty is to restore our patients to the normal.

Four Lines of Attack

In the direct treatment of obesity there are four lines of attack: two major, (1) diet, (2) exercise; and two minor, (3) drugs and (4) physical treatment. Except in some cases of endogenous obesity, diet and exercise are of paramount importance.

DIET

It is a common belief that a successful reduction diet must, of necessity, be unpalatable, unpleasant, and unsatisfying. This need not be so, provided care is taken in the selection of the component foodstuffs and variations are allowed for. Sir Edmund Spriggs, a pioneer of the measured and varied diet in obesity, made this clear enough when addressing[1] the Medical Society of London in January, 1929. "If," he said, "the amounts are measured there is hardly any food which may not be allowed—at least in small quantities. . . . It is essential to teach the patient that it is the total caloric value which counts, otherwise he runs away with the idea that some foods are fattening and that others, such as fruit, toast and biscuits of protein or rye are not, and that an obese person can be reduced by permitting this and forbidding that, irrespective of amount."

Many types of diet are described, varying in their composition, attractiveness, and reliability. One well-known American diet is made up of fruit and vegetables, bran, gluten bread, cheese, and buttermilk. Another somewhat similar one, which I have seen give good results, allows for breakfast: dried bread, fruit, milk, and tea; for lunch: omelette, salad, fruit, and dried bread; only tea and skim milk at teatime; and for dinner: steak, fillet of beef or chop, salad, and dried bread. The danger with the somewhat bizarre diets is that "after the cure" the patient is tempted to return to his fleshpots with renewed vigour. Mere reduction of quantities is not enough and a well-balanced reduction diet combines considerable protein, reduced carbohydrate and fat, made up of foodstuffs chosen so as to provide a bulky vehicle. Excess carbohydrate is often the cause of the obesity, but it should not be reduced so as to make the diet unpalatable, the patient lose energy or develop an acidosis. Vegetables and fruit make for bulk and are a convenient way to give carbohydrate; they also help in preventing constipation. Enough protein should be given to balance the loss of body protein due to daily wear and tear. This can be done in the early stages of reduction, but it is difficult to provide the necessary two to three ounces when the daily intake falls below 900 calories. The

* The substance of this paper was contributed to the discussion on obesity held by the section of medicine at the annual meeting of the British Medical Association at Melbourne on Sept. 11th.

body loses weight by the oxidation of its fat and the release of water. Fat in the food is therefore strictly rationed, allowing enough to supply the necessary fat-soluble vitamins. It is interesting to compare the number of calories derived from carbohydrate, protein, and fat respectively, in an ordinary diet of 2600 calories and in a reduction diet of 1300 calories. In the ordinary diet caloric proportions are carbohydrate 55 per cent., protein 14 per cent., fat 31 per cent., and in the reduction diet, carbohydrate 34 per cent., protein 33 per cent., and the fat 33 per cent. In reducing the nutritive value of the diet by one-half the proportion of carbohydrate has been notably decreased, the proportion of protein greatly increased, and the proportion of fat is almost unchanged.

Patients often ask how much water they may drink. If there is associated circulatory disease the amount should be kept low, but otherwise, on a weighed diet, no restrictions need be imposed. When the food is not weighed fluids are taken at the end of a meal after all the solid food has been eaten. There are certain precautions worth taking in the preparation of food. Butter and lard should not be used in cooking, fried foods should be avoided, lean meat should be chosen and it is best roasted or grilled. Tinned fruit should be washed in three or four changes of water and fresh stewed fruit sweetened with saccharin, which, in liquid or tablet form, provides a suitable substitute for sugar in a reduction dietary.

At Ruthin Castle, for convenience in working, we have a number of carefully balanced diets, ranging in caloric value from 1400–500 calories a day (List 1). In use these standard diets are regarded as a basis, and are varied in most instances to meet the needs and idiosyncrasies of individual patients. It may be necessary to replace one foodstuff with another more palatable one, or even to rearrange the whole day's menu so as to approximate as closely as possible to the meals the patients will take on leaving the clinic (Lists 2 and 3). It is important for the patient to be kept contented and not irritated by the restrictions imposed, and at the same time trained so that he may continue the régime in a modified form on his return to everyday life.

STANDARD DIETS

LIST 1

Ruthin Castle Standard Reduction Diets

Weights are given in grammes (30 g. = 1 oz.)

No.	1	2	3	4	5	6	7	8	9	10
Calories	1400	1300	1200	1100	1000	900	800	700	600	500
Carbohydrate	112	107	98	92	77	71	61	59	48	45
Protein	113	105	96	87	80	70	61	54	50	37
Fat	48	44	42	38	37	33	31	24	21	17
Hemicellulose	8	7	7	7	6	5	4	4	3	3
Breakfast										
Toast or white bread	25	25	20	20	15	15	15	15	10	10
	30	30	25	25	18	18	18	18	12	12
Butter	15	10	10	10	10	10	10	5	5	5
Fish group	180	150	120	120	100	100	90	90	75	50
Milk	75	75	60	60	60	60	60	50	40	30
Sugar-free marm.	15	15	15	15	15	15	15	15	15	15
Tea or coffee										
Lunch*										
Toast or white bread	20	20	20	20	15	15	10	10	10	10
	25	25	25	25	18	18	12	12	12	12
Meat group	90	90	90	75	75	60	50	40	40	30
Vegetables	200	180	150	150	120	120	120	120	100	108
Fruit stewed, unsweetened	100	90	90	75	75	75	60	60	50	50
or fresh fruit	130	120	120	100	100	100	75	75	65	65
Tea										
Bread and butter	30	30	30	25	25	25	25	25	15	10
Milk	75	75	60	60	60	60	60	45	40	30
Sugar-free jam	15	15	15	15	15	15	15	15	15	15
Tea										
Extra fresh fruit during day	170	150	120	120	75					

**Dinner*—as lunch with addition of reduction soup.

LIST 2

Example of a Diet of 1500 Calories (approx.)

In each list weights are given in grammes; ounces in parentheses.

Breakfast.—Grilled fish 120 (4), grilled fish 75 (2½) and one egg, bacon 20 (¾) with tomato 90 (3), cold ham 60 (2), bacon 15 (½) and one egg or two eggs; toast 30 (1), butter 10 (⅓), sugarless marmalade 15 (½), milk 45 (1½), tea.

Dinner.—Roast beef or roast mutton (hot or cold) 90 (3), grilled steak, boiled beef, grilled chop, boiled mutton, roast turkey or chicken 105 (3½), veal 120 (4), grilled sweetbreads 90 (3) with bacon 20 (¾), or liver 90 (3) with bacon 10 (½); vegetables (excluding potato) 120 (4) or salad (without dressing) 120 (4); stewed fruit 90 (3) or fresh fruit 120 (4); toast 30 (1), butter 10 (⅓).

Evening.—Fried fish 105 (3½) or meat as at dinner or scrambled eggs, two; vegetables and salad and fruit as dinner; cheese 30 (1); toast 30 (1); butter 10 (⅓); milk 45 (1½); tea. If vegetables are omitted toast may be increased to 40 (1½).

Supper.—Two water biscuits; milk 30 (1); tea.

LIST 3

Example of a Diet of 1000 Calories (approx.)

Breakfast.—Grilled fish 120 (4), grilled fish 75 (2½) with one egg, bacon 20 (¾) with tomato 90 (3), cold ham 60 (2), bacon 15 (½) and one egg, or two eggs (boiled or poached); toast 15 (½); butter 5 (⅙); sugarless marmalade 15 (½); milk 45 (1½); tea.

Dinner.—Roast beef or roast mutton (hot or cold) 60 (2), grilled steak, boiled beef, grilled chop, boiled mutton, roast turkey or chicken 75 (2½), veal 90 (3), grilled sweetbreads 90 (3) with bacon 10 (½), or liver 105 (3½); vegetables 120 (4) or salad 120 (4); stewed fruit 90 (3) or fresh fruit 120 (4); toast 15 (½); butter 5 (⅙).

Evening.—Fried fish 75 (2½) or meat as at dinner or two eggs (boiled or poached or as omelette); vegetables, fruit, toast, and butter as dinner; milk 45 (1½); tea. If vegetables are omitted toast may be increased to 30 (1).

Supper.—Two water biscuits; milk 30 (1); tea.

LIST 4

Instructions Given to Patients on Leaving Hospital

The diet should be made up as far as possible from fish, eggs and meat (except as stated below), green vegetables, parsnips, carrots, turnips, celery, mushrooms, cauliflower, onions, tomatoes, beetroot or salad, stewed and fresh fruits. Bread, toast, rusks, water biscuits, butter, cream, and cereals should be taken in small quantities only.

Foods to be avoided are: sugar, puddings, creams, cakes, sweet biscuits, shortbread, and nuts.

Salmon, herrings, pork, duck, bacon, savouries, rich sauces, potatoes, cheese, and made-up dishes such as pies, fricassées, rissoles, sausages, and macaroni cheese, which are concentrated foods, should be taken sparingly.

So far as possible no fluid should be drunk during meals until all the solid food has been eaten. A daily walk should be taken out of doors.

Example of a day's diet.—The food need not be weighed, though an occasional check is advisable; weights used in an average diet are given in grammes (30 g. = 1 oz.) and in ounces (parentheses).

Breakfast.—Grilled fish 120 (4), fish 75 (2½) and one egg, bacon 15 (½) and one egg, cold ham 30 (1) and one egg, two eggs, or bacon 30 (1); bread 20 (¾); butter 5 (⅙); sugarless marmalade 15 (½); milk 60 (2); tea or coffee.

Lunch.—Fish 120 (4) or meat 60 (2); two vegetables 75 (2½) of each or salad 120 (4); unsweetened fruit 90 (3) or fresh raspberries, strawberries, gooseberries, or melon 200 (6¾), greengages, peaches, nectarines, grape fruit, or orange 150 (5), cherries, apples, pears, plums, or grapes 120 (4), banana or figs 60 (2); bread 20 (¾); butter 5 (⅙).

Tea.—Bread or water biscuits 15 (½); butter 5 (⅙); sugarless jam 15 (½); milk 45 (1½); tea.

Dinner.—Clear soup or soup made from vegetables only; fish 40 (1½); meat, vegetables, and fruit as at lunch; bread 20 (¾); butter 5 (⅙).

Bread or toast should not exceed 75 g. (2½ oz.) and butter 20 g. (⅔ oz.) in the day. The body-weight should be taken regularly once a fortnight and an increase on two successive weighings followed by a stricter diet.

In deciding the caloric value of the diet with which to begin, attention is paid to previous habits as regards food and exercise and to the present physical condition. Each case must be judged on its merits, remembering that it is better to give too much in the early stages rather than too little. When a base line has been established the diet can be altered as required, preferably on the day of the weekly weighing, taking into consideration the general condition of the patient as well as the change of weight shown by the scales. It is rather astonishing what a difference can be made by slight modifications. Thus a glass of milk and a biscuit several times a week in the dietary of a man leading a regular life as regards food and exercise produced a gain of half a stone in six months, and it took nearly the same time for the original weight to be regained after the extra food was omitted. At Ruthin Castle the lowest standard diet is 500 calories a day. Cases are reported however where patients are said to have gone for months on a daily intake of under 400 calories, without ill-effects.[3]

Once patients have begun treatment they are anxious to lose weight quickly and try to stampede their medical adviser into arranging "starvation days" or "fast days" and the like. As a rule they require protection against themselves in this respect. Fluid days have their place in treatment, particularly in the early stages and again when the flabby fat has been got rid of and the weight tends to be stationary on a low diet and adequate exercise. A diet suitable for a fluid day may be made up as follows:—

Soup (clear stock soup, chicken tea or broth, marmite soup, oxo, bovril, &c.) or the juice of two oranges in a little water at 11 A.M., 1 P.M, 6 P.M., and 8 P.M., varied with tea and a little milk or lemon at 8 A.M., 4 P.M., and 10 P.M. In addition, water or simple lemonade may be taken as desired. On a soup day the patient receives 62 calories if whole oranges are given instead of the juice only, the caloric value rises to 410 and on the orange day 162 calories. According to his condition the patient on a fluid day takes full or reduced exercise or spends the day quietly in bed. If there is any doubt as to stamina, fluid days are best omitted and in any case should not be allowed more than once in seven or ten days.

To obtain the best results close coöperation and frankness between patient, doctor, and dietist are essential. "Breaking diet" is the great temptation and often great tact is required to prevent it. Hunger between meals can generally be appeased by a breakfast cup of clear soup and if this is not enough a slice or two of cold lean meat is given. Cold meat is preferable to hot as it is more readily available and more easily cleared of its surplus fat. In hospital the food can be supervised, varied, and weighed in a way not possible in a private house, and to counteract this as far as possible each patient, on leaving, is given written instructions for his guidance (List 4).

EXERCISE

Exercise should be prescribed as carefully as diet and consists for the main part of walking, putting, golf, and even tennis in suitable cases. Here also it is wise to begin quietly and increase gradually according to the weight lost and the response shown in the patient's general condition. The difference of pulse-rate and blood pressure before and after exercise is of great value in gauging how much a patient is capable of, and how much is good for him. Healthy tiredness is good, but exhaustion and fatigue are to be avoided. Exercise should be regular and steady and it requires constant supervision and encouragement to ensure this. A walk in the morning and some game in the afternoon is a good arrangement and a variation may be made by taking a 'bus or car in one direction and walking the other. The stiffer part of the walk, against the wind or uphill, should be done on the outward journey when fresh, and as a general rule walking alone is to be preferred.

The patient should be encouraged to regard his daily walk as an essential part of his treatment, which, if faithfully carried out, will produce a sense of mental and physical satisfaction in addition to melting his too solid flesh. Regular exercise demands regular rests, and periods of activity and inactivity should alternate. A good plan is to exercise in the morning and afternoon, with a rest after the midday meal and again before the evening one. This is difficult to arrange in ordinary life, but a useful substitute will be found in walking part of the way to and from the office or train, morning and evening, with a quiet time after the midday meal. Strenuous or "potted" exercise at week-ends, after a sedentary week, often does more harm than good and the same criticism applies to vigorous exercise before breakfast, though it suits some people. Before sanctioning either of these measures the doctor should satisfy himself that it is in the interest of the patient. Moderate exercise increases body metabolism three times and severe exercise nine times,[4] and with obese patients on active hospital treatment an occasional slack day is good policy: allowing a motor run, visit to a cinema, or something similar to replace the usual outdoor routine. It makes a pleasant break and prevents staleness. To take severe or even moderate exercise on a reduction diet calls for courage and determination, and as the labourer is worthy of his hire so is the hard-working reduction patient deserving of his occasional day of rest.

DRUGS

On theoretical grounds drugs should be the sole treatment necessary in endogenous obesity, and where hypothyroidism is the cause this is so, thyroid being specific. Rigid dieting is not required in these cases and as a rule is badly tolerated. In the other types of endogenous obesity the results from glandular therapy alone are uncertain and generally disappointing. This may be due to the unsuitability of the preparations at our disposal coupled with our incomplete understanding of the functional interlocking of the ductless glands. Where the obesity is genital or pituitary in origin we use diet, exercise, and thyroid, adding pituitary extracts in the pituitary cases and controlling the dosage by estimation of the basal metabolic rate and sugar tolerance. The evening pulse, if taken regularly, is a simple and useful guide in thyroid medication, as a rise of 10 to 15 beats per minute points to overdosage. In exogenous obesity and in many cases where an endocrine element may be suspected, but cannot be proved, thyroid plays an important part. When the weight tends to become stationary and it is thought unwise to decrease diet or increase exercise any further, a small dose of thyroid (gr. $\frac{1}{4}$–1 of the dried extract) should be given twice a day, unless some contra-indication is present. If necessary the dose may be increased later up to grs. 2 or $2\frac{1}{2}$, and I have never seen any ill-effects follow its use in this way. It is better not to let the patient know what he is taking, and it should be made quite clear that the drug is an adjuvant to, and not a substitute for, diet and exercise. Patients taking their own thyroid at home should be given a limited quantity at a time or instructed to omit it for the last ten days in each month. Unless under regular supervision they should

be warned as to the early symptoms of hyperthyroidism. There is a danger of establishing thyroid addiction unless precautions of this nature be taken.

A woman, for social reasons, began to slim by the aid of thyroid without her doctor's knowledge or consent, and in three months lost over 4 st. in weight. She was admitted to Ruthin Castle with a pulse-rate of over 120 per minute and complaining of shortness of breath, general weakness, palpitation, and nausea. A week after withdrawal of the thyroid the pulse-rate was 80, the breathing normal, and weight was being gained. In the next few years she had several relapses, always due to self-prescribed thyroid, accompanied by congestive heart failure and finally auricular fibrillation and œdema. In one attack withdrawal of thyroid and administration of salyrgan raised the daily output of urine from 200 c.cm. to 4000 c.cm. and lowered her weight by 1½ st. in eight days.[5]

Certain dinitrophenol substances are being used in preference to thyroid as they are claimed to have a less disturbing constitutional effect. They are said to raise the basal metabolic rate but not to have any effect on pulse-rate or blood pressure. This would appear to be a disadvantage, as the pulse-rate is helpful in controlling this type of medication. The most useful sphere for pluriglandular extracts such as Hormotone and Iodobesin is where obesity is combined with menstrual or climacteric disorders. In glandular therapy, as with diet and exercise, it is wise to begin quietly and increase the dose according to the patient's loss of weight and general response.

PHYSICAL TREATMENT

The patient can be made more comfortable by certain forms of physical treatment, though their effect on the weight is almost negligible. Massage strengthens the muscles and so facilitates the taking of more exercise. The belief, so generally held, that "hard or deep" massage "breaks up the fat" and so reduces weight is in our experience a fallacy. The electric light bath, by producing a profuse diaphoresis, improves the feel of the skin and the general tone, but the weight lost as fluid is as a rule regained within 24 hours. The electric stimulus, arranged to make the muscles contract against resistance, as in the Bergonié chair, is stimulating and soothing and often induces sleep. It is of particular use when circulatory disease limits exercise.

Results

There are few chronic disabilities where so great an improvement in the well-being of the patient follows a good start on proper lines. On a controlled diet and graduated exercise patients benefit, even when no weight is lost, and the loss of a few pounds will make a difference to the comfort, quite disproportionate to the result shown by the scales. Here a word of caution is needed. In the first week on diet and exercise the patient feels lighter and brighter in every way and looks forward with every confidence to the next weighing. Unless a warning has been given there is often great disappointment when it is found that the loss is very small, perhaps under 1 lb. In one girl of 23 there was no loss of weight in the first six days, though she stated she felt "totally different." With no essential change of régime, 9 lb. was lost in the following three weeks and thereafter 2 lb. a week. With steady carefully controlled reduction much good can be done and the results at times are comparable to those seen in myxœdema after thyroid medication.

Thus a woman of 51 had deteriorated mentally and physically while gaining weight over four or five years. She was slovenly and even dirty in her personal habits, her speech had become coarse, her mode of life varied between senseless extravagance and equally needless parsimony, and she had to be helped in and out of bed. With diet, exercises, and later a small dose of thyroid (gr. ½ twice a day) her weight fell from above 18 st. to below 12 st. She could then walk four miles a day comfortably, was bright and cheerful, clean in person, dress, and speech, and was leading an ordinary life socially.

We consider a loss of 10–14 lb. a month as sufficient in uncomplicated cases, though there is great individual variation: 26 lb. was lost by one man in 20 days, including 10 lb. in the first six and a half days, but this is exceptional. The greatest loss shown in Ruthin Castle records for one continuous course of treatment was 12 st. This was in a man of 30 years of age, and took eight and a half months, his weight falling from 25 to 13 st. Women often hold their weight or even gain in the week before a period: this is generally followed by an extra drop once the menstrual disturbance is over.

Insistence on a salt-free diet does not seem necessary, but patients are generally advised to content themselves with the salt used in cooking and to add as little as possible at the table. Bread is often a difficulty, and if the limited amount allowed produces hardship the addition of casein bread will often solve the trouble. The state of the feet should be inquired into when considering exercise, as obese people are particularly subject to corns, weakness of the arches and ankles, and, at times, their inability to take exercise is due to this.

For example, a woman of 61 attributed her overweight to restricted exercise due to multiple callosities on the soles of both feet. She was put on a mild reduction diet and after the corns had been treated walking exercise was begun. During her stay in hospital she lost 30 lb. in weight and another 1 st. after her return home. When admitted 400 yards at a time was her limit, but later she walked two to three miles in comfort.

The urine of reduction patients should be examined regularly, and if acidosis appears the carbohydrate in the diet increased. In our experience this is rarely necessary though some physicians give glucose at intervals or daily alkalis as a safeguard. Constipation is more often seen, but an increase in fruit or vegetables with a teaspoonful of liquid paraffin twice a day is as a rule enough to overcome it. The weekly weighing day is the patient's dread and the physician's bugbear, and special care is needed after these occasions to ensure that the régime is not relaxed or made stricter unreasonably as a result of what the scales reveal. The habit of regular weekly or fortnightly weighings should be continued after leaving hospital and an increase in weight on two successive weighings calls for a stricter diet or a consultation with the patient's doctor.

Much can be done to improve the mental outlook and physical condition of the obese. As a rule they are outwardly cheerful but when their confidence is gained it is generally found that they regard their disability more anxiously and resentfully than appears to the casual observer. With careful treatment and steady encouragement they respond well and "one is astonished at the unanimity with which patients report a return to vigour, a feeling of well-being and resistance to fatigue which has been lost for months or years."[3] Such a therapeutic result is worth working for.

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OBSERVATIONS UPON BILIARY DRAINAGE

By Thomas Hunt, D.M. Oxon., F.R.C.P. Lond.

PHYSICIAN TO OUT-PATIENTS, ST. MARY'S HOSPITAL, LONDON; LATE MACKENZIE-MACKINNON RESEARCH FELLOW

Much has been written on the technique and also on the diagnostic and therapeutic uses of biliary drainage. The present paper, based on over 100 cases in which it was used, makes no claim to review all these aspects of the subject. The group of cases analysed are selected from a much larger number, and form a series in which the diagnosis was definite and the biliary stimulus always the same—namely, 50 c.cm. of 33 per cent. warm magnesium sulphate solution. Any cases in which the position of the tube in the duodenum has been uncertain have been excluded, and in some the drainage has been performed twice or even three times if the result has been doubtful.

Biliary drainage has been carried out, first, on a number of persons whose biliary and hepatic systems was presumably healthy. A few of these have had no illness; the others have been sufferers from arthritis (12), hyperthyroidism (5), iridocyclitis (5), Ménière's disease (2), and neurosis (5). For purposes of comparison I have regarded these as normals.

It might be supposed that the rate and volume of biliary flow would enable us to draw conclusions about biliary disease, comparable to those we draw from the flow of urine. That hope, however, has not been fulfilled. The onset and the amount of flow after the introduction of the stimulus give little indication whether disease is present or not (Table I.).

Table I.—*Average Onset, Rate, and Volume of Bile-flow* (74 *Cases*)

Type of case.	No.	Time to onset of flow.	Duration of flow.	Total bile flow.	Flow per minute.
		mins.	mins.	c.cm.	c.cm.
Normal patients ..	22	9	28	40	1·4
Pathological gall-bladder (cholecystitis)	16	6	24	50	2·0
Gall-stones ..	6	3	27	46	1·7
Liver disease ..	20	8	27	45	1·7
Cholecystectomy ..	10	7	14	40	3·0

Even with a seriously damaged liver (e.g., in advanced cirrhosis) bile is secreted after the injection of magnesium sulphate in about normal quantity after the normal latent period and at about the normal rate. On the other hand, the flow is certainly much faster after removal of the gall-bladder, and this suggests that the quantity and rate of flow, after the dose of magnesium sulphate, is governed less by the organic condition of the liver than by some controlling influence of the gall-bladder; the normal response to the introduction of magnesium sulphate seems to be an *emptying* of the gall-bladder and liver, and is not wholly dependant upon liver secretion.

Similarly it might be hoped that the symptoms produced by reflex stimulation of the biliary flow would give some indication of disease in the gall-bladder when this contracts and empties its contents. The symptoms, however, prove no certain guide (Table II.). A gall-bladder containing stones may empty its contents normally with no symptoms or discomfort, and this is of interest in relation to the causation of symptoms in cholelithiasis. As a rule, however, there is considerable discomfort, and sometimes severe pain over the gall-bladder and in the right hypochondrium and epigastrium, during the flow. Patients who have had their gall-bladders removed are particularly apt to have severe nausea,

Table II.—*Reaction to Introduction of Warm Magnesium Sulphate into Duodenum* (133 *Cases*)

(50 c.cm. of 33 per cent. solution)

Type of case.	No.	Showing symptoms.*	Showing no symptoms.	Per cent. showing symptoms.
Normal patients ..	37	6	31	16
Liver disease	21	4	17	19
Pathological gall-bladder (cholecystitis)	13	4	9	38
Proved gall-stones ..	10	7	3	70
Patients after cholecystectomy ..	11	9	2	82
Migraine patients ..	41	16	25	39

* Nausea, pain, discomfort, vomiting.

discomfort, or vomiting while the flow is in progress. Also symptoms are about twice as common in chronic cholecystitis, and about four times as common in the presence of stones, as they are in the normal subject. Hence the course of the drainage should be carefully watched and noted. In severe cirrhosis of the liver there is rarely pain or discomfort, and in only 4 patients out of 21 suffering from hepatic disease was there vomiting during or immediately after the flow of bile.

Undue stress should not, however, be laid on these findings, owing to the unavoidable psychological effect of carrying out the test. (Special care was taken in these cases not to let the patient think that anything other than water was being injected down the tube.) It is known also that symptoms may vary with the type of stimulus employed so that from the diagnostic point of view results in different hands may be difficult to compare.

Another fact that is remarkable is that such a relatively large dose of magnesium sulphate introduced direct into the duodenum—about 4 drachms of the salt—causes nausea or discomfort in less than 1 in 5 normal subjects; and if the bile is removed by the tube it seldom produces much diarrhœa. The same dose introduced into the stomach usually causes profuse diarrhœa and, as would be expected, more nausea and vomiting. This observation suggests that part at least of the purgative effect of magnesium sulphate is dependant either upon the increased flow of bile into the intestine or upon the effect of the salt in the stomach where it may set up gastro-colic stimulation either chemically or reflexly.

Complete failure to obtain any bile after introduction of the magnesium sulphate is very rare, provided care is taken to ensure the correct position of the tube. In five patients only have I noted complete absence of any reflex biliary flow to this stimulus, though in no case was the test abandoned under 35 minutes, and in most cases not till a longer time had elapsed. (In 3 of these cases 1 c.cm. of pituitrin given subcutaneously also failed to bring about withdrawal of bile from the tube.) In all these there

was no doubt about the position of the tube, but the only response to the introduction of the usual stimulus was a slow secretion of 15–20 c.cm. of thick mucoid white fluid, strongly alkaline, which I regard as pancreatic in origin.

Four of these five patients showed a curiously similar clinical picture. Three were female and one male. All were very neurotic and all complained of long-standing upper abdominal discomfort, with attacks of severe pain amounting to true colic, coming on two or three hours after food. Three of them were woken about 2 A.M. with severe pain, and all stated that they could not eat eggs or fat without discomfort or pain. In two cases the symptoms had followed a severe mental shock. Only three of these patients were radiographed after administration of tetraiodophenolphthalein by mouth and of these two showed no shadow of the dye; the third gave a normal concentration. One of the patients showing no dye shadow was operated upon later and the report was "enlarged gall-bladder; no stones; no inflammatory changes. Cystic duct constricted. Cholecystectomy performed." In this patient an eight-hour residue in the stomach was also shown by barium meal, without any evidence of any organic lesion.

I think that these five patients almost certainly belong to the group of functional spastic dyskinesias of the gall-bladder (Westphal, Newman), due to nervous causes, and in the absence of obstructive jaundice complete failure to obtain any bile is suggestive of such functional disorder of the biliary passages.

TABLE III.—*Concentrated "B" Bile*

Type of case.	No.	"B" bile.		Per cent. showing *no* "B" bile.
		Present.	Absent.	
Normal patients	22	19	3	14
Pathological gall-bladder (cholecystitis)	16	4	12	75
Gall-stones	8	3	5	62
Liver disease..	19	16	3	17
After cholecystectomy ..	10	0	10	100
Migraine patients	35	27	8	23

Failure to withdraw any concentrated "B" bile, which comes at least in part from the gall-bladder itself, has very much less significance however (again in the absence of obstructive jaundice). From Table III. it will be seen that in over 10 per cent. of normal subjects no gall-bladder (or "B" bile) was found. In none of 10 patients subjected to biliary drainage at periods from 3 months to 14 years after cholecystectomy was any true concentrated "B" bile obtained, though certain workers state that it may be recovered in a proportion of such patients (Martin).

In only about a quarter of the cases of gall-bladder disease have I obtained a normally concentrated "B" bile.

As a rule, when "B" bile is not obtained, the cholecystographic shadow is below normal; but there is a divergence of some 30–40 per cent. in my cases both in patients showing a normal shadow and those giving no shadow or an abnormally faint one. (Table IV.). The second group shows the diagnostic significance of a positive cholecystogram (absent or very faint shadow) combined with the withdrawal of a normal concentrated "B" bile. This is a highly characteristic finding in liver disease, and I have noted it in 7 cases of cirrhosis of the liver (4 of which were proved by operation). Such a combination is likely when the liver is so diseased that it fails to pick out

TABLE IV.—*Oral Cholecystography and Biliary Drainage*

Oral cholecystogram.	No.	Concentrated bile.	No concentrated bile.	Percentage agreement.
Normal shadow ..	20	12	8*	60
Absent or very faint shadow	25	8†	17	70

* 8 cases: 1 cholecystitis (oper.), 3 cholecystitis (?), 3 migraine, 1 normal.
† 8 cases: 7 cirrhosis of liver, 1 migraine.

the opaque dye from the portal circulation in sufficient concentration, whereas biliary concentration in the gall-bladder (being healthy) is unimpaired so that dark "B" bile is obtained by drainage. The use of the two methods in combination may therefore be worth while where cirrhosis of the liver is suspected. A further characteristic feature of severe cirrhosis of the liver is the striking appearance of the bile which has a bright red colour, unlike the normal yellow, brown, or dark mahogany tinge.

As regards the chemical, microscopic, and bacteriological findings in bile, I only propose to mention two points. The first refers to the significance of crystals on microscopic examination, since some writers have regarded the findings of both cholesterol and pigment deposits together as pathognomonic of gall-stones (Bochus). Thus Piersol records that all his cases in which both crystals were found proved to have calculi; of 40 patients investigated by Rafsky, in whom both types of crystals were found in the bile, only 1 showed no calculi or cholecystitis at operation. The observation is one of considerable diagnostic importance, but there are a few records of the incidence of these crystals in the bile of normal people.

Table V. shows the microscopic findings in my patients, in all of whom the bile was examined soon after withdrawal—just as urine must be examined if

TABLE V.—*Crystalline Deposits in Bile (91 Cases)*

Type of case.	No.	Cholesterol only.	Pigment only.	Cholesterol and pigment.	No crystalline deposit seen.
		No. and per cent.	No. and per cent.	No. and per cent.	
Normal patients ..	43	14 (33)	18 (42)	9 (21)	1
Liver disease ..	14	1 (7)	5 (36)	5 (36)	3
Pathological gall-bladder (cholecystitis)	10	1 (10)	8 (80)	1 (10)	–
Proved gall-stones.	13	0	3 (23)	10 (77)	–
After cholecystectomy	11	2 (19)	1 (9)	7 (64)	–

significance is to be attached to crystalline deposits. In 9 out of 43 (21 per cent.) of my presumed normal subjects both types of crystals were present; they were also found in 10 out of 13 cases of proved gall-stones. (I have not attempted any quantitative comparison of the numbers of crystals.) From this it seems that the coexistence of cholesterol and

calcium bilirubinate crystals cannot be regarded as pathognomonic of gall-stones, though strongly suggestive of that condition. It is significant that the proportion of cases showing both types of crystals was about the same after cholecystectomy (almost always for gall-stones) as in subjects of cholelithiasis which implies that there is some underlying abnormality of the bile in gall-stone subjects, apart from inflammatory changes in the gall-bladder itself.

The last point concerns the significance of protein in the bile, as tested by the very rough Esbach's estimation. I have found 0·5 part per 1000 represents an empirical normal level, and that the level is increased in more than half the cases of cirrhosis and other diseases of the liver, and also in about the same proportion of cases of gall-bladder disease. It appears that a marked increase of albumin in the bile may be due either to alteration in the secretion of bile by the liver, or to its concentration by the gall-bladder. In a number of migraine patients showing a *dense* shadow by cholecystography—which means that the concentration of gall-bladder bile is increased—the protein content of the bile was particularly high.

I do not think the protein content of the bile is of practical value in the diagnosis of gall-stones or cholelithiasis. In all cases the figures refer to the protein estimated in the most concentrated specimens of bile obtained in each case, though there is usually little difference in this respect between the various fractions of bile removed.

SUMMARY

(1) Observations upon biliary drainage in over 100 cases, using magnesium sulphate as a stimulus, are recorded. (2) The rate and volume of biliary flow gave no indication as to the condition of the liver, gall-bladder, or biliary passages. (3) Pain, nausea, and other symptoms were observed during the flow of bile in 16 per cent. of normal subjects, but more frequently in the presence of gall-bladder disease. (4) Failure to obtain any bile by drainage, in the absence of jaundice, was rare (5 cases only); dyskinesia of the gall-bladder is suggested as a cause in some of these patients. (5) In 10 per cent. of normal subjects and 75 per cent. of cases of gall-bladder disease no "B" bile could be withdrawn. (6) Results are compared between oral cholecystography and biliary drainage in 45 cases; failure to visualise the gall-bladder by oral cholecystography, in association with the finding of "B" bile by drainage, was found to be characteristic of liver disease. (7) Calcium bilirubinate (pigment) and cholesterol crystals were found together in the bile in 21 of normal subjects and 77 per cent. of gall-stone subjects.

My thanks are due to the trustees of the Mackenzie-Mackinnon Research fellowship; also to Dr. H. Orton and Dr. Courtenay Gage for very kindly carrying out the radiographic examinations, and to my colleagues at St. Mary's Hospital for allowing me to investigate patients under their care.

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A CASE OF AGRANULOCYTIC ANGINA

By B. J. BOULTON, M.B. Brist.

ASSISTANT RESIDENT MEDICAL OFFICER, HAM GREEN HOSPITAL AND SANATORIUM, BRISTOL

A WOMAN aged 47, unmarried, was admitted to Ham Green Isolation Hospital (Bristol Public Health Department) on May 24th, 1935, the case being notified as one of suspected faucial diphtheria.

History of illness.—She first consulted her doctor on April 2nd, 1935, complaining of a sore-throat which developed by the 5th into a definite follicular tonsillitis. Swabs taken were returned negative. The throat condition did not clear up until April 14th. On May 21st there was a recurrence rather worse than the previous attack, which rapidly became more severe. On May 23rd an area of inflammation appeared on the dorsum of the left hand.

On admission (May 24th) the general condition was poor and the patient appeared to be acutely ill. The temperature was 103° F., the pulse-rate 128, and the respirations 28. Tongue furred. The fauces showed yellow semi-membranous sloughs with very little inflammatory reaction apart from narrow areas of erythema around each. Heart sounds poor, lungs normal; the spleen was not palpable and there was no jaundice. The urine contained a trace of albumin. The lower part of the nose was inflamed and swollen, and the dorsum of the left hand and lower forearm showed a large inflamed area with a blackish superficial necrosis and no attempt at pus formation. The surrounding tissues were soft. Antistreptococcal serum (20 c.cm.) together with antidiphtheritic serum (800 units) was administered intramuscularly.

Progress.—By the following day (May 25th) there was no improvement in the patient's condition and the possibility of this being a case of agranulocytic angina was discussed. A leucocyte count gave a figure of 625 per c.mm. Examination of blood films revealed an obvious neutropenia; some of the smears showed less than a dozen white cells in all and these were chiefly lymphocytes. A differential count, based on 50 cells only, resulted as follows:—

Polynuclears	6%	Transitionals	6%
Small lymphocytes	66%	Eosinophils	0%
Large lymphocytes	22%	Basophils	0%

Arneth count impossible. Red cells appear normal.

As supplies of pentose nucleotide were not immediately available, sodium nucleinate in doses of gr. ¾ were administered intramuscularly at four-hourly intervals. On May 27th (after 12 doses of sodium nucleinate) the total leucocyte count gave a figure of 2813 per c.mm. and the differential count was as follows:—

Polynuclears	51%	Eosinophils	0%
Small lymphocytes	16·5%	Basophils	0%
Large lymphocytes	23·0%	Myelocytes	6·0%
Transitionals	3·5%		

Arneth count	Class— 1	2	3	4	5
	61%	29%	7%	2%	1%

Arneth index 93·5%

Red cells show early anæmia. Several normoblasts seen.

These results, however, did not appear to coincide with any improvement in the general condition of the patient who rapidly became worse and died on May 28th. Pentose nucleotide injections in 10 c.cm. doses had been commenced on the previous day. Unfortunately, it was not possible to carry out a post-mortem examination.

We are unable to obtain any evidence in this case of a previous ingestion of amidopyrin as an exciting cause. There was, however, an obvious focal infection of dental origin. It is doubtful if an earlier administration of pentose nucleotide would have affected the ultimate issue of an acute fulminating case such as this, with a total leucocyte count below 1000.

I am indebted to Prof. I. Walker Hall for the blood counts and examination of the films.

RIGHT-SIDED EVENTRATION OF THE DIAPHRAGM

WITH NOTES ON A CASE

By F. G. Nicholas, M.B. Lond., D.M.R.E.

ASSISTANT RADIOLOGIST TO THE MIDDLESEX HOSPITAL, LONDON

AND

A. M. Nussbrecher, M.D., M.R.C.P. Lond.

LATE MEDICAL REGISTRAR AT THE HOSPITAL; PHYSICIAN TO THE SELLY OAK HOSPITAL, BIRMINGHAM

Eventration was first recognised as an entity by Jean Louis Petit (1674–1750). The reports that followed his description were sporadic, but of late years interest in the condition has revived. Writing in 1923 Morison [1] defined it as follows: "It is generally accepted that the term Eventration Diaphragmatica should be applied to those cases of congenital origin in which there is a diffuse relaxation of one-half of the diaphragm, so that it extends high up into the thorax forming a sac. . . ." He himself reporting six left-sided cases stated that all those hitherto recorded, except Eppinger's,[2] have likewise been on the left side. This is not strictly correct, however, because Hamdi [3] published a right-sided case in 1905; the eventration occurred in a man of 50 and contained stomach and liver. There is also a third case described by Bayne-Jones [4] in 1916 in a man of 52. Here the clinical diagnosis was confirmed at operation: the dome of the right side of the diaphragm reached the third rib in front and showed paradoxical movements; the liver was high up in the chest.

Wessler and Jaches [5] mention a case of eventration in which distended coils of colon occupied most of the right side of the chest; at operation the right side of the diaphragm was found intact but atrophied. They state that in right-sided eventration the liver is displaced downwards.

Golob [6] records a case of asymptomatic right-sided eventration discovered on routine examination in a man of 57 suffering from carcinoma of the œsophagus.

Upensky's [7] three cases occurred in women, aged 19, 25, and 31 respectively. They all showed paradoxical movements of the diaphragm. He draws attention to the great difficulty in differentiating right-sided eventration from right-sided diaphragmatic hernia.

Morris's [8] case is interesting because transposition of abdominal viscera was present in addition to right-sided eventration.

The following case, which, for reasons set out below, we regard as one of right-sided eventration, is the ninth recorded.

CASE REPORT

The patient is a woman of 57, single. Nothing of interest in the family history. Very delicate since birth, and in early infancy her life was often despaired of. In 1908 while planting flowers in the garden she experienced a sudden severe pain in the right side of the chest. Thought to have pleurisy and explored with a needle several times, with negative results. Dr. Samuel Gee was called in and pronounced the condition to be one of congenital atelectasis. Patient states that she always has a feeling under right arm "as if something were there" and that she is tender in that spot. Never cyanosed, but always tended to get out of breath on going upstairs. She has been an invalid for several years on account of rheumatoid arthritis. She was recently treated for "depression" at the Woodside Hospital. An abdominal tumour, which eventually turned out to be the liver, was discovered there, and she was transferred to the Middlesex for further investigations.

Appetite good. No abdominal pain. No constipation or diarrhœa. The only evidence of digestive disturbance are slight flatulence and occasional morning vomiting. She complained of cough recently and a slight hæmoptysis occurred seven months ago.

Examination.—Colour fair. No clubbing of fingers. Heart regular; apex-beat in fifth space, in nipple line; soft systolic murmur at apex; second aortic sound accentuated. B.P. 180/110. Diminished movements on the right side of the chest. Tactile fremitus absent at the right base. Lower half of right thorax dull to percussion. No breath sounds heard over dull area, but occasional gurgling is plainly audible, especially after taking liquids by mouth. Above, the breath sounds are poor and a few crepitations are heard, but air entry fair at right apex. Lower edge of liver felt in right iliac fossa. Central nervous system: nil abnormal found. Joints: typical changes of rheumatoid arthritis.

RADIOGRAPHIC FINDINGS

Chest.—A dense shadow obscuring the detail of lung and other structures was seen to occupy the middle and lower zones of the right lung. The upper border of the shadow was convex and peaked in one place, suggesting the possibility of an adhesion. The rest of the lung fields appeared clear, and the heart and the mediastinal contents showed no displacement (Fig. 1). The absence of lung markings over the affected part and the lack of mediastinal displacement confirmed the clinical findings of atelectasis of the right middle and lower lobes. In the lateral view (Fig. 2) in the upright position, the left side of the diaphragm was well outlined and normally placed, and the upper border of the shadow noted on the right side in the anterior-posterior view was seen to be dome-shaped and reaching the level of anterior part of the second rib (Fig. 2). The movements of the upper border of the shadow on the right were poor but synchronous with those of the left side of the diaphragm.

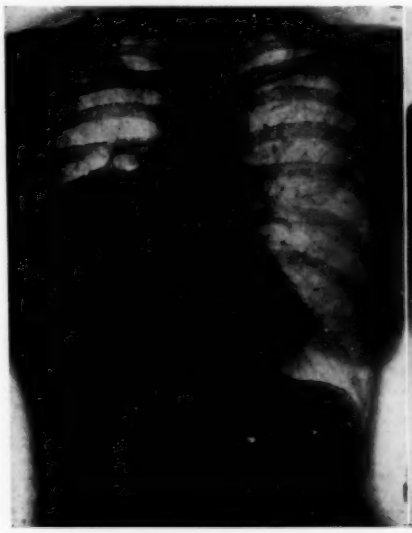

FIG. 1.—A.P. view of chest showing marked elevation of the right side of the diaphragm.

FIG. 2.—A lateral view showing both sides of the diaphragm.

Opaque meal examination.—The œsophagus was normal in length, position, and function. The stomach showed no abnormality apart from its low position and slight dilatation, the lower part of its greater curve being 2 in. below the level of the iliac crest. The duodenal cap was found stretched out, pointing upwards towards the right side of the chest. In the upright position the stomach had great difficulty in expelling the meal through the cap, and barium was seen passing upwards in a very narrow stream making a small loop before entering the right side of the chest. No constricting point was noticed (Fig. 3). In the lying position the stomach emptied with greater ease and coils of small intestine were soon outlined in the right side of the chest. Further passage of the meal demonstrated that not only the small gut, but also the cæcum and most of the colon were in the right thorax.

An opaque enema confirmed the barium meal findings as regards the colon and showed its intra-abdominal part extending obliquely from the right side of the chest to the rectum. The length of the intra-abdominal part of the colon was approximately 12 in. (Fig. 4).

It is interesting to note that despite the abnormal position of most of the gut the examination revealed no gross disturbance of function. The stomach took over five hours to empty, as was to be expected from the extent of its dilatation and the degree of stretching of the duodenum. There was no delay in the passage of the meal through the small intestine and at five hours both the intrathoracic and intra-abdominal parts of the colon were outlined. At 24 hours the small intestine was empty, but at 48 hours a residue of barium was still present throughout the colon.

Position of the other viscera.—The lower border of the *liver* extended to the middle of the sacrum; its upper border could not be traced definitely and only a little of the liver shadow was seen to the left of the spine. A cholecystographic examination showed the *gall-bladder* lying over the middle of the body of the sacrum; it functioned normally. The *spleen* was situated in its normal position under the left cupola of the diaphragm. Both *kidneys* were well outlined after an injection of Uroselectam. The left kidney was slightly low in position, its pelvis being opposite the body of the second lumbar vertebra; the right kidney was high, its pelvis being opposite the body of the twelfth dorsal vertebra, but it was clearly within the abdomen.

DIAGNOSIS

There are many problems in the diagnosis of diaphragmatic abnormalities. Clinical examination alone offers little help, and unaided by X rays would often fail to discover the presence of such lesions; but even X rays may leave the issue unsettled and such methods as inducing a pneumoperitoneum or measuring variations in intragastric pressure may have to be resorted to before a definite diagnosis is arrived at. Our case was fortunately sufficiently clear-cut for us to be able to dispense with these procedures.

The literature is full of conflicting statements as regards movements of the diaphragm in eventration; some authors like Morison [1] affirm that paradoxical movements are always present in the absence of adhesions, others that the diaphragm is motionless, while others again maintain that the movements are synchronous. Our case supports the third contention.

Wood and Wood [9] point out that care must be taken to distinguish congenital eventration from (1) those intra-abdominal conditions where the diaphragm is pushed up, as in ascites, pregnancy, subphrenic abscess, and megalocolon; or (2) such lung conditions as fibroid phthisis, atelectasis, or neoplasm which may cause the diaphragm to be pulled up; or (3) cases of paralysis of the phrenic nerve from disease, trauma, or operation; or (4) temporary elevation due to trauma.

It must be realised, however, that the distinction between congenital eventration and the acquired condition may be exceedingly difficult or even impossible, and that in either case the final state of the diaphragm may be identical—that is, it may present a sheet of thinned and stretched-out fibrous and areolar tissue with few or no muscle-fibres.

In the differential diagnosis of our case we considered: (1) paralysis of the diaphragm, (2) eventration, (3) hernia, and (4) absence of the right half of diaphragm. The negative history, radiographic and clinical findings ruled out the first, and the radiogram showing an unbroken dome of the right side of the diaphragm eliminated the third and fourth possibilities. We were left with the diagnosis of the rare condition of right-sided eventration and were forced to conclude that it was of congenital origin as we were able to eliminate the other possible causes of high diaphragm.

Our case offers a warning against indiscriminate needling of the chest in obscure cases, because unless eventration or hernia of the diaphragm have been eliminated there is a great danger of perforating a viscus.

FIG. 3.—This shows the stomach and the stretched-out duodenum; the small intestine is seen in the right side of the thorax.

FIG. 4.—Barium enema—a lateral view.

TREATMENT

Thoracic surgery has made sufficient advances to tackle successfully many cases of diaphragmatic hernia, but eventration, as far as one can see, is not properly amenable to surgical interference; and even if it were possible in the case here reported, one would still hesitate to advise it since the condition gives rise to

hardly any symptoms and the likelihood of serious disability in the future appears remote.

It is a pleasure to thank Dr. C. E. Lakin and Dr. W. R. Gilmour for their permission to publish this case.

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A CASE OF ACETYLSALICYLIC ACID (ASPIRIN) POISONING

BY S. C. DYKE, D.M. Oxon., F.R.C.P. Lond.

CONSULTING PATHOLOGIST, THE ROYAL HOSPITAL, WOLVERHAMPTON

FEW cases of poisoning by acetylsalicylic acid (aspirin) have been reported in this country. Sir William Willcox [1] though including its consideration in a lecture on "toxic drugs," has lately placed upon record the opinion that aspirin is "one of the most valuable and safe of simple remedies." The last case of acetylsalicylic acid poisoning placed on record in this country appears to have been that reported by Hitch [2] in 1928; in this case death occurred after a dose of grs. 1000; in the same year, Jankovich [3] from Paris recorded five fatal cases; he formed the opinion that the fatal dose was in the neighbourhood of grs. 300. More recently, Balázs, [4] writing from Budapest, where the taking of acetylsalicylic acid appears to be a favourite method of attempting suicide, has reported on 752 cases of which, however, only 4 proved fatal. Balázs considers the minimum fatal dose to be in the neighbourhood of 30 to 40 g. (grs. 450 to 600).

The case here reported ended in recovery; the dose so far as could be ascertained was grs. 435. Inasmuch as on first being seen the patient was in a stuporous condition and quite unable to give any assistance, and as there was nothing in the circumstances of the case to indicate the nature of the trouble it presented a very pretty diagnostic exercise.

CASE RECORD

The patient was a woman, aged 26; she supported herself, and was living in lodgings, both parents being dead; as she was a newcomer to the locality she had no friends or intimates who could give any information likely to throw light on the case.

She was first seen by Dr. D. M. Brown on March 6th, when she complained of buzzing in the ears and nausea; there was no vomiting; temperature 99 and pulse-rate 100. She remained much the same until the evening, when she became deaf and started to wander; she was restless and disoriented all night, and when seen on the morning of March 7th was in a stuporous state with symptoms suggestive of cerebral irritation.

Through the courtesy of Dr. Brown a specimen of urine was made available for examination before the patient was seen by myself. This showed a certain amount of reduction of Fehling's solution, a large amount of acetone, some albumin, and gave a very strong purple colour with aqueous perchloride of iron. Although the amount of acetone present was large, the depth of colour given by the perchloride of iron was much in excess of that met with even in severe ketosis; inquiry at the time elicited the fact that the patient had been given no salicylates by her doctor.

When first seen, the patient was lying with her head buried under the bed clothes; she was unable to answer questions or to speak rationally, and on being disturbed showed resentment and became extremely restless; she was very thin and appeared extremely dehydrated; all reflexes were present and normal; the eye grounds showed no abnormality; Kernig's sign was absent and there was no neck rigidity; temperature was just under 100° F. Respirations were deep and slow and of the type met with in severe "acidosis."

No diagnosis was made; a sample of blood was taken for examination and the removal of the patient to a nursing-home arranged. The blood showed no leucocytosis (white cells 3500 per c.mm.), and films presented no abnormalities; blood-sugar was 0·112 and urea 0·054 per cent.; quantitative examination of the urine showed the reduction to be the equivalent of only 0·35 per cent of glucose. These examinations served to exclude diabetes, uræmia, or an acute bacterial infection as the cause of the trouble, but failed to establish any definite diagnosis.

The immediate indications appeared to be to correct the dehydration and the ketosis, and on admission of the patient to the nursing-home, instructions were given to empty the bowel by enema and to administer 5 per cent. glucose in saline by the rectum and fruit juice and glucose by mouth. The parenteral administration of fluid and glucose was withheld until it could be seen whether the patient would retain fluids administered orally.

Seen in the evening of the same day the condition remained much the same and the diagnosis still in doubt. Lumbar puncture was performed; only a local anæsthetic was used and the patient appeared unconscious of what was going on. The cerebro-spinal fluid was under a pressure of 180 mm. of water; it was allowed to flow until it had fallen to 120 mm. On examination the fluid showed a great deal of acetone to Rothera's test, and gave a strong purple colour with the perchloride of iron; there was no increase of cells or of globulin or albumin, and chlorides were present in normal amount.

The condition improved strikingly after the lumbar puncture; the patient spent a quieter night and in the morning, although semistuporous, appeared better; the hyperpnœa was passing off; she had taken fluids readily throughout the night, there had been no vomiting, and she appeared much less dehydrated. Irregular pyrexia of from 99° to 101° continued. The Rothera reaction of the urine was less deep, but the perchloride of iron reaction remained strong. The urine now also showed bile salts in large amount and a trace of urobilin.

The mental conditon with the pyroxia had given rise to suspicion of some form of infective encephalitis; the normal cytology and the absence of increase in the proteins of the cerebro-spinal fluid served to render this diagnosis unlikely. In the light of the evidence then to hand the case was evidently one of severe metabolic disturbance, due to some poison; diabetes and uræmia had been excluded and no other likelihood of endogenous poisoning presented itself; of exogenous poisons acetylsalicylic acid or some combination of it with a barbiturate appeared possibilities. The cerebro-spinal fluid was tested for the barbiturates with negative results, and a tentative diagnosis of aspirin poisoning was then made.

Lumbar puncture was repeated; the pressure of the fluid was now only 140 mm. It was drained until it fell to 110. The fluid showed a trace of acetone but still gave an intense reaction with perchloride of iron though the colour was less deep than in the previous day's specimen.

On the third day the patient was physically a great deal better; the mental condition remained dull and stuporous and she was still quite unable to talk rationally or to give any account of herself. By this time relatives were on the scene, and with their assistance a search of the patient's room was made; the only relevant article discovered was a bottle which had originally contained 100 5-grain tablets of acetylsalicylic acid, and in which 12 tablets still remained. This was regarded as favouring the diagnosis of acetylsalicylic acid poisoning.

Throughout the first three days of the illness, while mentally dull and stuporous, the patient displayed occa-

sional fits of extreme restlessness especially if disturbed; during these spasms certain movements were regularly repeated; sometimes she raised herself in bed and bringing the hands to within about a foot of the head made movements as though endeavouring to stroke the scalp, but unable to bring the hands any nearer to it; a further series of movements repeated at intervals were identifiable as being associated with certain frequently repeated movements involved in the work by which she earned her livelihood. The condition improved rapidly after the second lumbar puncture, and on the fourth day she was able to hold rational conversation. She complained that her head felt enormously large; this apparently explained the curious stroking movements referred to in the previous paragraph; she further complained of disturbance of vision, stating that everything looked streaked and barred.

An attempt was now made to ascertain from the patient the cause of the trouble; when shown the bottle containing the acetylsalicylic tablets, she at once recognised it as her property and volunteered that she had taken one tablet from it though not for her own use; she inquired where all the missing tablets had gone, and stoutly denied having consciously taken any of them herself. She was unable to account for the missing 87 tablets, and finally admitted that she must herself have taken them. She persisted in her denial of any recollection of having done so.

Inquiry of the relatives elicited a history of peculiar "turns" diagnosed in the past as "petit mal," and it seemed probable that the patient had consumed the tablets while in a somnambulistic state. The patient was seen by myself after this; I am informed by Dr. Brown that she made a good recovery and in about a month was entirely herself again.

COMMENT

Apart from the diagnosis the interest in this case lies in the type of the clinical manifestations; these pointed to a profound disturbance of metabolism, and to toxæmia with a heavy incidence on the higher nervous centres. In the early stages the extreme hyperpnœa was a marked feature; Quincke [5] noted this as one of the symptoms of salicylic acid poisoning; he regarded it as being due to the direct action of the acid radicle of the compound on the respiratory centre and called it "Salizyldyspnœ" Balázs points out that in acetylsalicylic acid poisoning, this hyperpnœa appears only when acetone is present in the urine, and when a state of so-called acidosis has been established. He regards it as being due to the action of the acid substance released as a result of the disturbed metabolism and not directly to the acid radicle of the salicylic acid. He investigated the alkali reserve in several of his patients and found that in extreme cases it might fall to between 30 and 40 per cent. If the hyperpnœa were due to actual liberation of acid radicles from the ingested compound, it might have been supposed that the urine would be strongly acid; in the present case the urinary pH was found to range from 5·8 to 6·4, which is not unduly to the acid side.

Evidence of the widespread nature of the toxæmia was afforded in this case by the urine which showed (in addition to acetone) bile salts, albumin, and granular casts; these findings made it evident that both liver and kidneys were severely damaged. Albumin was present at first in large amount, and at the last observation on the fifth day was still present in traces; bile salts remained present in fair amount throughout the period of observation.

The temperature ranged during the first four days from normal to 101°; it settled on the fifth day; about a week later, I am informed by Dr. Brown, it again rose and remained up for several days; no physical signs indicative of inflammatory trouble accountable for the pyrexia could be found. Balázs noted similar pyrexia in several of his cases; he regards it as being due to a disturbance of the cerebral heat-regulating centre.

Treatment.—Even in the absence of a diagnosis, the obvious indications in this case were from the onset to correct the dehydration, to combat the acidosis, and to support the liver against further damage. To this end, as mentioned above, glucose-containing fluids were pushed in every possible way. The question of the exhibition of insulin was considered but the normal blood-sugar level was regarded as a contra-indication; Balázs found it of no service. As a means of combating the ketosis he recommends the administration of sodium bicarbonate both enterally and parenterally; in my experience, sodium bicarbonate is of little value in combating the ketosis of diabetic coma, and was accordingly not used in this case.

The beneficial effect of lumbar puncture was striking; on both occasions on which it was performed it was followed by a sudden and definite improvement in the general condition. The very strong reaction with ferric chloride given on both occasions by the cerebro-spinal fluid would indicate the presence in it of large amounts of the drug, and it is reasonable to suppose that benefit was due to removal from contact with the central nervous system of fluid saturated with the noxa. The beneficial effect of drainage of the cerebro-spinal fluid in this case of acetylsalicylic acid poisoning is in conformance with general experience in barbiturate poisoning in which also the noxa is taken up in large amount by the fluid.

SUMMARY

A case of poisoning by acetylsalicylic acid is described. The dose was 435 grains; the symptoms were those of profound toxæmia with evidence of hepatic, renal, and cerebral damage; symptoms referable to the alimentary tract were absent; lumbar puncture was beneficial; recovery ensued.

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PAPILLŒDEMA CAUSED BY A CERVICAL CORD TUMOUR

BY DOUGLAS McALPINE, M.D. Glasg., F.R.C.P. Lond.

PHYSICIAN IN CHARGE DEPARTMENT FOR NERVOUS DISEASES, MIDDLESEX HOSPITAL; PHYSICIAN TO HOSPITAL FOR EPILEPSY AND PARALYSIS, MAIDA VALE, LONDON

THE occurrence of papillœdema with a tumour of the cervical cord has been so seldom reported that the following case seemed worth recording:—

A woman, aged 20, was admitted to Middlesex Hospital on July 20th, 1934. She said that she had been in good health until June, 1932, when she noticed an aching pain in the left occipital region; soon afterwards the neck became stiff, so that she had difficulty in turning her head to the left or bending it backwards. In December, 1932, she experienced pain in the right shoulder and down the outer side of the right arm; these pains were aggravated by coughing and sneezing. A few months later similar pains were felt in the left arm. In January, 1934, she was admitted to a hospital on the south coast because the pain in the neck had become increasingly severe. During her stay in this hospital she had attacks of nausea without vomiting but accompanied by moderate headache. At no time did she notice any weakness of

her arms or her legs. On April 29th, 1934, her neck was manipulated for a supposed torticollis. On coming round from the anæsthetic she noticed that the left leg had become stiff and weak; seven days later the right leg was similarly affected; she also found that the movement of the head was further limited. The pain in the back of the neck became more severe and was accompanied by frontal headache and nausea. Before the manipulation she had experienced slight difficulty in starting micturition but afterwards she had retention followed by incontinence.

Examination.—Mentally the patient was alert and coöperated well. She was unable to lie flat in bed because extension of the head caused pain. The head was constantly flexed to the right, but without any definite rotation. Suboccipital tenderness was noted especially on the left side. Pupils equal and reacted normally. No ptosis. Ocular movements full. Inconstant nystagmus. Approximately 3 D. of papillœdema was present. Corneal reflexes brisk. No sensory loss on face. No facial weakness. No deafness. Remaining cranial nerves normal. *Upper limbs.* No wasting. Power at all joints both arms good. No abnormal posture. Reflexes present and equal with the exception of a diminished left triceps jerk. No cerebellar signs. *Lower limbs.* Total paraplegia: right leg in extension; left leg in mild flexion. Deep reflexes exaggerated. Plantar responses extensor. Strong tendency to involuntary flexor spasm. *Sensation.* Hyperæsthesia on outer aspect of both arms as high as the shoulder. All forms of sensation diminished on inner aspect of both upper arms as far down as the elbow. Postural sense, stereognosis, and compass test normal in both hands. All forms of sensation much diminished on trunk and lower limbs up to the level of D. 2 segment. Complete postural loss of the toes of both feet. Incontinence of urine.

Section of the tumour at the seventh cervical segment.

The patient showed no sign of active tuberculosis in chest, and no enlargement of superficial or of mediastinal glands. The liver and spleen were not enlarged. The cerebro-spinal fluid (lumbar route) had an initial pressure of 100 mm. water, which on jugular compression rose to 140 mm.; the descent was slower than normal. The fluid was yellow with rapid clotting and contained protein 1·78 per cent. Cisternal puncture showed an initial pressure of 305 mm. water, with slightly yellowish fluid containing protein 0·18 per cent. Radiography of skull and spine revealed no abnormality.

Pre-operative diagnosis.—The history suggested a mid-cervical tumour. The highest limit of sensory loss appeared to be at the level of D. 1; but there was hyperæsthesia as high as C. 5. There was no definite evidence, from the history or the signs, of a primary posterior fossa tumour. The clinical picture could be explained by a high cervical tumour of considerable length which had penetrated the foramen magnum and so caused an increase in intracranial pressure. However, one would have expected a tumour in this situation to have caused weakness in the arms. The possibility of two tumours had to be borne in mind, one in the posterior fossa and one in the cervical region. An intramedullary rather than an extramedullary tumour of the cervical cord on the whole seemed the likeliest diagnosis. The patient was transferred to the Hospital for Epilepsy and Paralysis, Maida Vale, and was operated upon by Mr. Charles Donald on August 24th. The laminectomy extended from C. 1 to C. 5, and later the edge of the foramen magnum was also removed. A marked bulging of the dura was apparent which, when opened, showed the cord much enlarged by a tumour which was partially extramedullary and involved the cord itself. The cord was swollen from just below the foramen magnum to beyond the lower limit of the wound. A piece of tumour was removed which proved to be a glioma. Subsequently the papillœdema subsided somewhat. A month after the operation the motor power of the upper limbs was still unimpaired; however, the patient developed bedsores and had attacks of respiratory embarrassment, one of which proved fatal on Oct. 2nd.

Post-mortem.—An elongated tumour was found, partly extramedullary and partly intramedullary, extending from C. 1 segment to approximately D. 1 segment. It lay posteriorly, and chiefly on the right side of the cord. The surface was irregular and soft. Serial sections showed that the tumour was mainly extramedullary at the level of C. 1 to C. 3, and below this level invaded the cord. The intramedullary portion was confined to the dorsal half of the cord. At the level of segments C. 6 to C. 8 it reached its maximum width. No cerebral tumour was found; there was a moderate bilateral hydrocephalus.

DISCUSSION

The association of papillœdema with a cervical tumour is extremely rare. No attempt has been made to make a full search for isolated cases, but Elsberg,[1] in his well-known book on "Tumours of the Spinal Cord," makes no mention of papillœdema in dealing with tumours situated in this region. Elsberg and Strauss [2] in 1929 reported five cases of high cervical tumour, in which the tumour lay both within the vertebral canal and the posterior cranial fossa, and papillœdema was absent in all of them. In each one the tumour was circumscribed and its removal was possible. Carlill and Carling [3] have reported a case very similar to the present one.

A female, aged 41, experienced pain in the left arm followed by weakness in this limb and later weakness and numbness in the legs. Three months after the onset headaches became marked; three dioptres of papillœdema was present on the right side and a hæmorrhage was seen around the left disc. There was atrophy of the intrinsic muscles of both hands, a spastic paraplegia, and a dissociated type of anæsthesia on the trunk and right leg. The cerebro-spinal fluid by the lumbar route showed 0·6 per cent. albumin and by cisternal puncture 0·01 per cent. Lipiodol was held up opposite the fifth cervical spine. A cervical laminectomy disclosed a uniformly enlarged cervical cord that did not pulsate; papillœdema rapidly subsided after the operation. Attacks of unconsciousness, relieved at first by cisternal puncture, followed, but the patient died a month after the operation. Post mortem the tumour was found to extend to the base of the brain. There was moderate internal hydrocephalus.

Davis [4] showed a similar case before the New York Neurological Society in 1923.

A male, aged 24, for two years had suffered from headache, dizziness, and vomiting. Subsequently he improved but showed slight papillœdema, diminution of the deep reflexes in the arms, and a left extensor plantar response. No sensory changes were found. The cerebro-spinal fluid findings were negative but no mention is made of the protein percentage. Two months later he showed weakness and atrophy of the arms and hands and sensory loss between segments C. 3 and D. 1. On one occasion he had a generalised convulsion without loss of consciousness. A mid-cervical laminectomy disclosed a cord completely filling the dural cavity with an apparent lack of fluid below level of segment C. 4. At this level an intramedullary cavity was disclosed. The papillœdema subsided. In this case the tumour was evidently a diffuse

intramedullary tumour of the cervical cord possibly associated with syringomyelia.

Papillœdema very rarely occurs in syringomyelia. Alpers and Comroe,[5] however, have described such a case in which there was much papillœdema which led to the consideration of a cerebral tumour in addition to the cord condition. A subtemporal decompression was performed but the patient died shortly afterwards. In addition to cervico-dorsal syringomyelia a marked degree of hydrocephalus was present which the authors considered was due to an inflammatory process of the roof of the fourth ventricle extending into the lateral recesses which had probably blocked the foramen of Magendie and Luschka. They referred to other four cases of syringomyelia showing papillœdema; in two of these there was much internal hydrocephalus, the cause of which was not determined. In one case there was a tumour of the fourth ventricle. In the remaining cases only clinical data were available.

The cause of the papillœdema in the present case is not clear. The tumour did not extend into the foramen magnum. The cord was uniformly enlarged and it filled the subdural space at the level of the lower cervical segments. It should be noted that the protein content of the cerebro-spinal fluid, obtained by cisternal puncture, was high. Theoretically a high cervical tumour extending through the foramen magnum into the posterior fossa, or vice versa, might be expected to produce papillœdema more readily than a tumour confined to the cervical cord. Clinically, however, this seldom occurs except possibly in isolated cases. It is probable that with a circumscribed tumour such as is most frequently met with in this situation the block is not complete; on the other hand, a diffuse glioma of the cervical cord leads to a uniform enlargement and the block is greater, even if the tumour does not actually extend into the foramen magnum. It would be unwise to speculate further from such limited material on the actual cause of the papillœdema in these cases. Three points, however, suggest themselves for consideration. Firstly, in each of the three cases referred to the tumour of the cervical cord was a diffuse one; secondly, in two of the cases the maximum growth of the tumour had not occurred at the uppermost level of the cervical cord; thirdly, the tumour tends to fill the whole subdural space at its maximum point of growth.

It has to be borne in mind that cerebral gliomas are occasionally associated with metastases in the spinal cord.[6] The commonest variety of glioma to metastasise in this way is the medulloblastoma, the favourite seat of which is the cerebellum. Confusion might therefore arise between the type of case reported in this paper and a medulloblastoma of the cerebellum with a secondary deposit in the cervical cord. Nystagmus might occur in both conditions. However, in addition to a careful history, which would probably indicate the initial site of the tumour, the medulloblastoma would declare itself by the presence of cerebellar signs.

Another feature of interest in the present case is the absence of paresis in the upper limbs despite the involvement of the whole of the cervical enlargement by tumour. Perhaps this may be explained by the dorsal situation of the tumour, but it is well known that diffuse glioma of other parts of the nervous system, particularly of the brain-stem, may cause remarkably few focal signs.

SUMMARY

1. A case of diffuse glioma of the cervical cord associated with papillœdema is described, and two other similar cases are referred to. Certain deductions are made as to the conditions necessary for this association.

2. The case is also noteworthy because of the retention of motor power in the arms.

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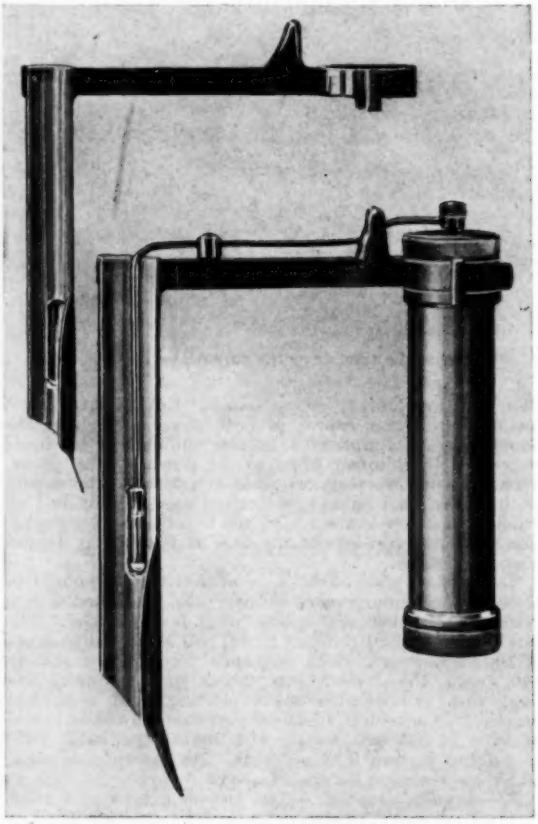
NEW INVENTIONS

A DETACHABLE LARYNGOSCOPE

IT has appeared to me undesirable to boil the part of the laryngoscope which contains the electrical equipment so I have had this part made detachable. A smaller mouth-piece is also made which can be fitted on to the handle of the apparatus for use with



children. The actual tube of the laryngoscope is made flatter on the upper side so that the tongue is kept more out of the way and it is easier, by means of an introducer, to pick up a tube introduced through the nose and push this through the cords.

The laryngoscope has been made for me by the Dental Manufacturing Company, London.

JOHN ELAM, M.R.C.S.

REVIEWS AND NOTICES OF BOOKS

The Subnormal Mind

By CYRIL BURT, Professor of Psychology, University of London. London: Humphrey Milford, Oxford University Press. 1935. Pp. 368. 10*s.* 6*d.*

WHATEVER comes from the pen of Prof. Burt is assured of scientific detachment and clear exposition. When some years ago he published the "Young Delinquent" he established himself as more than an academic psychologist, as one who could give at once a sympathetic and scientific account of human problems. In this book he maintains the same humanistic spirit; his work in mental tests has always shown a devotion to accuracy in method and deduction. The book is important in that it gives a clear account of the psychology of mental defect and dullness, and of the methods for their assessment and the educational manner of handling them. The chapter on delinquency is a lucid résumé of the author's earlier volume, but the chapters on the neuroses are new in matter and in method of exposition. Dr. Burt clearly distinguishes between asthenic and sthenic neuroses; in the former group he places the exhaustion states usually described as neurasthenia and some anxiety states. The asthenic neuroses are largely physical in origin; whereas sthenic neuroses are mainly psychical. Inasmuch as he is largely concerned with the conditions in children he does not fall back upon the deep layers of the unconscious for explanation. The history is briefer in such child cases and the psychic patterns less complex. While frankly sympathetic towards psycho-analysis, he does not hinder the reader with the more recondite psycho-analytic explanations, although it is to be assumed that he could accept in the main the Freudian psychology. Among the sthenic neuroses he places the hysterical group, compulsions, obsessions, and anger neuroses—in fact, the behaviour disorders. All these conditions call for social handling and psychotherapeusis from encouragement and suggestion to full psycho-analysis. It would be difficult to think of a book in which mental defect and psychoneuroses have been more clearly and accurately described in simple language, and most medical men, including specialists and general physicians, would be the wiser for studying this readable volume.

Annual Review of Biochemistry

Vol. IV. Edited by JAMES MURRAY LUCK, Stanford University. California: Annual Review of Biochemistry Ltd. 1935. Pp. 639. $5.

THE appearance of each new volume of this annual review is anxiously awaited by workers in laboratories. This year there are many changes in the personnel of contributors, sometimes, but by no means always, for the better. Some of the articles are of especial interest. The section on Biological Oxidations and Reductions by R. Sonderhoff is excellent, giving a good summary of the present position of this ever-changing subject. The recent investigations of Wieland on the dehydrogenases of yeast are very clearly described, and the work of Szent-Györgyi and others on muscle dehydrogenase is noted. The section closes with a succinct summary of the relationship between Warburg's yellow enzyme and the flavins. Recent work on carbohydrates and glucosides by Sir J. C. Irvine and G. J. Robertson is also summarised, with a good review of the work that has lead to the establishing of formulæ for some of the disaccharides and polysaccharides. The Chemistry and Metabolism of the Compounds of Sulphur by H. B. Lewis is a particularly valuable contribution which will be much appreciated. The section on the hormones by B. A. Houssay is disappointing in that recent developments, particularly with regard to the sex hormones, are not described at all clearly. B. E. Holmes's article on malignant disease is a useful addition to the book, but we would have liked to have seen a fuller discussion of the relationship between certain sex hormones and malignant disease. One of the most interesting sections in the book is Robert Robertson's summary of the present position of knowledge with regard to the chemistry of the alkaloids.

The work as a whole is quite up to the excellent standard of the three previous issues, and is therefore necessary to all biological workers.

Public Ill Health

By C. E. MCNALLY, Hon. Treasurer, Committee Against Malnutrition. London: Victor Gollancz Ltd. 1935. Pp. 224. 5*s.*

THIS is a provocative book and is intended to provoke. The author is as angry as Jonah was when the Almighty called upon him to denounce Nineveh and afterwards relented. Mr. McNally is exceedingly displeased with Sir George Newman for what he regards as his official tolerance of widespread physical deterioration. Where the truth about the prevalence of malnutrition lies between the late C.M.O.'s apparent optimism and the author's extreme pessimism cannot be determined so long as there is no accepted objective standard. Mr. McNally's chapters are a useful contribution to the study of malnutrition, but he is, we think, under some misconception as to the functions of an officer of the Ministry of Health. Whatever his personal views may be, a civil servant can hardly express criticism of "the whole economic structure of the milk market" or the restriction on the import of foods.

The personal issue apart, there can be no quarrel with the author's main thesis of the association of disease and poverty. Some criticism is possible of certain points: thus the failure of young adult life to respond to the fall in the tuberculosis death-rate is a widespread phenomenon not limited to depressed areas, and is a puzzle to tuberculosis experts, nor is close association proved between maternal mortality and malnutrition, witness the statement in the Scottish report, "Scrutiny fails to reveal that lack of food was a factor in maternal mortality." But that large numbers of our people live under economic and social conditions under which optimum health is difficult or impossible of attainment will not be disputed, and it is well that this should be set forth with a reformer's zeal. The main subject dealt with in this respect is diet. There are useful chapters on food values and requirements, and justifiably caustic comment on the economics which permit the wholesale destruction of food-supplies while populations lack the necessities: there is also sympathetic understanding of the difficulties, too seldom appreciated, which encumber the housewife living in poor property. We have thus on the one hand an insistence on the B.M.A. dietary standard as a minimum, and on the other hand emphasis on the impossibility of attainment of this minimum by a large section of the population. Hence in the author's view ill-nutrition is inevitable.

The problem is not primarily medical but economic.

How his laudable desire that every family should have sufficient purchasing power to obtain more than the B.M.A. minimum is to be fulfilled the author does not indicate: it is unfortunately at present beyond attainment by many wage-earners. There are many counsellors in the market place—communism, social credit, birth control, return to the land, restriction of imports, freedom of trade: there is no certain guide to the promised land and the author does not help us here. Few would, however, dispute that the condition of our people is better than formerly, and even the author admits this as regards school-children, though he qualifies his statement by the words "as reflected by the look of the children." We have travelled far since the Report on the Sanitary Condition of the Labouring Population of Great Britain in 1842, which initiated the public health movement and doubtless will travel further. But progress hitherto made is no ground for complacency, an attitude which this book will help to combat. It is probable that the next orientation of public health will be in the direction of nutrition, with an increasing recognition of its importance and the filtering through to the general population of the scientific knowledge now available. Mr. McNally's book will help to stimulate such a movement.

Theory and Practice of Anæsthesia

By M. D. NOSWORTHY, M.A., M.D., B.Ch. Cantab., Anæsthetist to Westminster Hospital. London: Hutchinson Scientific Publications. 1935. Pp. 223. 12*s*. 6*d*.

THIS is a first-rate book for any man to study when he is beginning to give anæsthetics. That is not to say that it contains no substance for the experienced anæsthetist; indeed, it is so well conceived and clearly written that the expert may gain much from its perusal. Dr. Nosworthy's attitude towards his subject is throughout scientific and up to date, but he is fully alive to the value of the older methods and insists that the student must be thoroughly taught the use of ether and chloroform before he is allowed to extend his experience to other drugs. The author has a high opinion of the value of carbon dioxide in many conditions, especially for producing separation of the vocal cords. He commends cocaine (10 or 20 per cent.) as a spray to the throat to prevent laryngeal reflex, especially before laparotomy, and this measure, which originated we believe with Magill, is certainly not used as often as it deserves to be; its efficacy in aiding abdominal relaxation is remarkable. Dr. Nosworthy does not fail to point out the care that is needed to obviate inhalation of foreign matter when the larynx is thus deprived of its reflex.

In discussing respiratory failure under ether he makes a statement with which we cannot agree. It is fatal, he says, to resort to artificial respiration, as then the patient, from lack of carbon dioxide, will never breathe again on his own. Theoretically this may be right; in our experience it is not true in practice. In discussing the peripheral causes of respiratory arrest Dr. Nosworthy is able to show how some of the most modern methods may cause, if ill-applied, the very trouble they are designed to remove. For spinal analgesia Dr. Nosworthy prefers percaine and stovaine to novocain. His advice on the choice of the appropriate anæsthetic in various conditions, premedication, and after-effects is concise and helpful. An attractive feature of the book is that it contains no superfluous words. The print is of a capital size and clearness, and the illustrations plentiful. We should like the author to reconsider the use of the word "anæsthesia" in the title where "anæsthetics" would be appropriate; the former is a state (of loss of feeling), the latter is an art which may be practised.

Laboratory Manual of Physiological Chemistry

Third edition. By MEYER BODANSKY, Director of Laboratories, John Sealy Hospital, Galveston, and Professor of Pathological Chemistry, University of Texas; and MARION FAY, Associate Professor of Biological Chemistry, School of Medicine, in the University. New York: John Wiley and Sons, Inc.; London: Chapman and Hall Limited. 1935. Pp. 274. 10*s*.

THIS volume constitutes the third edition of a work which is the practical counterpart of Prof. Bodansky's well-known "Introduction to Physiological Chemistry." Both the books have had a success which can be attributed to the clear way in which they are written and the fact that the author has maintained a modern outlook. Of especial interest is the full practical course, which would however be considered too full for English medical students, whose curriculum does not provide much time for biochemistry. Most of the methods are colorimetric, and few teaching laboratories in this country are sufficiently well equipped to supply all the students with colorimeters.

British Journal of Children's Diseases

(Vol. XXXII., July–September.)—In a paper entitled A Contribution to the Epidemiology of Poliomyelitis Dr. Hjalmar Wennerburg, chief physician to the Epidemic Hospital, Gothenburg, maintains that neither the contact theory nor the water theory can solve the problem of infantile paralysis, but that the theory that the disease is disseminated by insects clearly explains all hitherto obscure phases of its appearance. As regards the species of insect, he is inclined to suspect some kind of mosquito.—Dr. E. Ashworth Underwood, in continuation of his article on the Neurological Complications of Varicella, deals with laboratory investigations of the cerebrospinal fluid, the relation between the occurrence of nervous complications, and the type of varicella, which shows that nervous complications are more liable to occur after severe attacks of varicella; the prognosis based on a study of 109 cases, of which 12 died, 80 recovered completely, 15 showed recovery with some sequelæ, and 2 did not recover; the pathology, epidemiology, and theories regarding ætiology. The last are classified in the following five groups: (1) The occurrence of encephalitis following varicella is purely fortuitous. (2) The nervous symptoms are due to the virus of some known disease. (3) The nervous symptoms are due to some unknown virus. (4) The condition is due to the virus of the primary disease, varicella. (5) The anaphylactic theory enunciated by Glanzmann, who holds that the nervous complications following varicella are a local anaphylactic phenomenon due to sensitisation of the nervous system to the actual virus of the disease.—In continuation of his Analysis of Over Four Thousand Cases of Educational Deafness seen during the past Twenty-five Years Mr. Macleod Yearsley describes a method of procedure whereby deafness in children can be detected at an early age, and urges that the deaf child should commence his special education as soon as possible, especially if he is born deaf or has become deaf during the first two years of life.—The abstracts from current literature are devoted to dermatology and syphilis.

THE LANCET

LONDON: SATURDAY, SEPTEMBER 14, 1935

THE USE OF ASPIRIN AND SOD. SAL.

NOT the least of the contributions of chemistry to human well-being is the gift of aspirin, now manufactured and swallowed by the ton. Its analgesic effects and its safety are so widely known that its use has long passed into the control of the general public, with much encouragement from the manufacturers and little guidance from the medical profession. Yet the doctor is asked from time to time whether it is "safe" to go on taking aspirin, and he meets now and then a cautious patient who will venture to take five grains for her headache but is afraid to risk ten. He prescribes both aspirin and sodium salicylate very often himself, but not always with the precision or the understanding of their effects which modern knowledge renders possible. Only very rarely will he meet the clinical picture of poisoning from gross overdosage, so vividly described elsewhere in this issue by Dr. S. C. DYKE, but such cases are on record, and include fatalities not only from accidental or suicidal administrations but also—witness a recent French report [1]—from injudicious therapeutic use.

Decoction of willow-bark was a febrifuge dating from ancient times. Salicylic acid was prepared from it in 1838, and synthetically in 1860. Sodium salicylate was introduced as a remedy for acute rheumatism in the 'seventies, and hailed as a specific. Many regard it as such to-day, but on slender evidence. Since the cause of acute rheumatism is not known, no specific effect on the causal agent is at present demonstrable, and the question can be decided only by considering the amelioration of symptoms. Sodium salicylate reduces the temperature in acute rheumatism, but it does the same in "influenza" and some other febrile states, and to a slight extent in many normal subjects. It relieves pain, both in this and other conditions. Neither of those actions is specific, yet together they constitute most of the salicylate effect in acute rheumatism. The arthritis, it is true, subsides at the same time, which a gonococcal arthritis will not do under salicylate treatment; but then an acute rheumatic arthritis will often subside under antipyretic and analgesic treatment with other drugs, such as quinine and morphia. On the whole, however, the salicylates in acute rheumatism have a more prompt, regular, and satisfactory effect than other drugs or drug combinations and for that reason they remain unquestionably the remedy of choice. Such treatment is mainly if not entirely symptomatic, and unfortunately it does not seem to prevent the development of rheumatic carditis, or to influence the course of rheumatic chorea where antipyretic and analgesic actions are not called for. Where and how salicylate exerts its analgesic effect is unknown. It lowers temperature by disturbing the heat-regulating centre, causing vasodilatation in the skin, increased heat-loss, and often sweating. Larger doses cause ringing in the ears and vomiting, the latter being a central and not a gastric effect. The largest doses produce stupor. So far as is known, the antipyretic action, the vomiting and the coma form a sequence of effects exerted by increasing doses of salicylate on the brain. We choose to call the first therapeutic and the second and third toxic, but they may well be all of the same nature. In rheumatic fever the full therapeutic effect is desired. Sodium salicylate is absorbed and circulates as sodium salicylate; most of it is excreted unchanged in the urine, where it appears inside 10–20 minutes; the remainder is partly destroyed in the body, and elimination is complete in a couple of days. With such rapid absorption and excretion, accumulation is not to be feared, and dosage must be large and frequent if the adequate concentration in the blood is to be reached. Hence it is both safe, and necessary to a full therapeutic effect, to give 10–20 grains of sodium salicylate, hourly or two-hourly, until the patient vomits or his ears ring, which is likely to happen after 120–200 grains have been given. Then it should be stopped, or continued at a lower level, according to the course of the temperature and other clinical features.

Pharmacologically aspirin closely resembles sodium salicylate, but there are certain differences. Although sparingly soluble in water, it is absorbed from the intestine as fast as salicylate, and much of it reaches the blood as sodium acetyl-salicylate, which almost certainly has a more pronounced analgesic action than salicylate. It is rather more slowly excreted, but the same principles as for salicylate apply to its use in acute rheumatism, the "toxic" dose being a little smaller. To the stomach it is slightly irritating, and in an acid stomach some hydrolysis can occur yielding highly irritating salicylic acid. The chief value of the sodium bicarbonate which is customarily given with aspirin, as well as with sodium salicylate, is to counter these effects. With aspirin it will also counter any disturbance of the acid-base equilibrium which that acid—unlike the neutral sodium salicylate—might produce. HANZLIK,[2] to whom we owe much of our quantitative knowledge of the salicyl compounds in medicine, found bicarbonate without effect on the "toxic" symptoms of salicylism, and, although this has been disputed, it is supported by the fact that bicarbonate obviously does not impair the therapeutic effects of salicyl compounds, which are of the same nature as the "toxic" ones. He also found no difference between natural and synthetic salicylates, which used to be set against each other years ago; both of them are equally potent and equally toxic, and with modern methods of

[1] Paisseau, G., Friedman, E., and Vaille, C.: Bull. et mém. Soc. méd. hôp. de Paris, July 16th, 1934, p. 1201.

[2] Hanzlik, P. J.: Medicine, 1926, v., 197.

manufacture neither is at all likely to contain any harmful impurities. Aspirin has the peculiarity that not a few subjects are sensitive to it in the allergic sense, and after taking it may develop urticaria, œdema of face or pharynx, salivation, or asthma. They usually learn to avoid it, but there is real danger in it for some asthmatics who may not know of their sensitivity, or take it unwittingly in some proprietary form; two cases have recently been reported [3 4] where 5 grains precipitated fatal asthmatic attacks. Apart from that danger however, aspirin in ordinary doses appears to be singularly safe, without harmful effects even after long periods, and not viciously habit-forming; while such evidence as we have, including Dr. DYKE'S case, points to a fatal dose of the order of 500 grains.

THE ROUND WORLD

SHROPSHIRE is a proper place, and the enjoyment of anyone going up and down that delectable county will be about doubled if he reads and digests the guide book which Prof. W. W. WATTS, F.R.S., this year's president of the British Association, published about 15 years ago. It is an exceptionally good book for its purpose, for out of an account of the minutiæ which may be seen he builds up a convincing demonstration that the appearance of a neighbourhood and the lives of its inhabitants are due at bottom to its geological history. In the presidential address to the Association which he gave at Norwich last week he returns to the same theme in its wider aspects and discusses how the surface, not of a county but of the world itself, has come to look as it does. It is a little disconcerting to the layman to learn that there is no explanation generally acceptable to geologists of how the hills and valleys came into existence, no explanation, that is, of the features which, with all respect to those who love the wide skies of East Anglia, make up what most of us call "scenery." Trivial mounds and ridges may be the obvious results of glacial action; minor furrows are equally clearly the handiwork of rivers. These things were realised in the revolution of geological thought which led up to the "Origin of Species"; the wearing away of the earth's surface here and its piling up there have gone on in the past as they go on now, and the ceaseless action of everyday weather is responsible for the variety of surface which charms our holiday moods and, guided by Prof. WATTS, excites our interest. Such was LYELL'S great contribution to the progress of knowledge. But when it comes to larger features the matter is not so clear and the origin of the Great Glen or of Snowdonia are matters on which there is still much difference of expert opinion. We used to be told that the skin of the earth has wrinkled as it cooled, as does the rind of a shrivelling orange. But is it possible that this has happened without the intervention of local changes so sudden and so great that they are indistinguishable from the paroxysms and catastrophes which were the universally accepted cause of the surface appearance of the earth till about 100 years ago? We might think more of these if we lived over a less phlegmatic part of the earth's crust and if earthquake had not dropped out of the occasions of violence and sudden death enumerated in our Litany. It is the present belief that the blocks of land which form our continents are floating on a denser liquid mass much as icebergs float in the sea. That they do not move about as fast is plain, but it seems quite likely that they have moved as much, and it is quite certain that what is now land has been under the sea often enough. These changes seem to need some occasional, perhaps periodic, motion of a violent and extravagant kind, and to the question of how that may have come about Prof. WATTS devotes the more technical parts of his address. One comforting reflection emerges—that through all these changes and chances the line of life has never been broken and biological evolution has gone on. We owe indeed much of our knowledge of it to the very fact that sea and land have been turned upside down. And if live things have survived so far, it seems hardly likely that they will succumb to any similar convulsions in the future; there will always be an ark of some kind.

IS CANCER OF THE LUNG INCREASING?

IN spite of the number of papers which have appeared in the last few years on the subject of lung cancer, there is still no decisive evidence whether this form of malignant disease is really on the increase or not. The recorded death-rate in England and Wales has certainly shown a pronounced rise during the last 30 years, but the very magnitude of the increase suggests, as the Registrar-General has pointed out, improved means of diagnosis as at least a major cause. One difficulty of accepting it as the sole cause is that the mortality-rate of males has risen considerably more than that of females. The impossibility of assessing the part played by such changing standards of certification of death has led to the attention of workers being transferred to the statistics of the post-mortem room, where a more stable degree of accuracy is likely to prevail. With these figures we are, however, faced with the problems of selection. Patients admitted to hospital are only a sample of all patients, and those submitted to autopsy are only a sample of all those dying in hospital. Whether persons suffering from intrathoracic cancer are more or less likely to be admitted to hospital to-day than, say, 25 years ago we do not know. In some hospitals it appears probable that they are more easily admitted, for purposes of teaching, ameliorative treatment or research. Where changing proportions of the dead are submitted to autopsy there is, likewise, no means of determining whether the type of case sent to post-mortem has not also changed. For instance, with a growing interest in lung cancer, patients in which this condition is suspected might be more frequently autopsied than in previous years. This would

[3] Lamson, R. W., and Thomas, R.: Jour. Amer. Med. Assoc., 1932, xcix., 107.
[4] Dysart, B. R.: Ibid., 1933, ci., 446.

result in an apparently rising incidence. On the other hand, if patients dying of some other causes of death were more frequently than heretofore sent to autopsy we might well observe a declining incidence of lung cancer. This rate—the ratio of lung cancers to other causes of death—is, in fact, dependent both upon the numerator and the denominator of the fraction and changes in either must influence its level and trend.

In a recent paper[1] R. D. PASSEY and J. McD. HOLMES, working with a combined grant from the London Headquarters and the Yorkshire Council of the British Empire Cancer Campaign, suggested that a more satisfactory denominator consists of the number of patients admitted to the wards of the hospitals. It is not unreasonable, they argue, to expect that if there be a large increase in the number of in-patients, there will be also a proportional increase, other things being equal, in the number of patients admitted with lung cancer, which will be reflected in an increase of the latter in the post-mortem room. The incidence-rate they use is, therefore, the number of post-mortem intrathoracic neoplasms expressed as a percentage of the admissions to hospital. Their figures, which were obtained as part of a larger inquiry into the incidence of cancer in general, the results of which are to be published later, were derived from 16 large teaching hospitals of London, the provinces, and Scotland. The statistics for all these hospitals combined show a considerable increase in the absolute number of lung cancers recorded at autopsy. But concurrently there has been between 1894 and 1924 a corresponding rise in the total admissions to hospitals, so that the percentage incidence has shown no significant change over those 30 years. In the last five-year period taken, 1924–28, the percentage incidence has risen, but this change is derived nearly entirely from 5 out of the 16 centres. In these particular centres the authors believe there are associated special circumstances, which they discuss, which may well have contributed to the increase. Generally, therefore, they find by this method no evidence to support the view that the incidence of lung cancer is appreciably on the increase.

These figures, though suggestive, hardly lead to a decisive answer. Over the period studied the total number of patients admitted to these hospitals has risen enormously, and in those hospitals which show no proportional increase in lung cancer this rise in total admissions has been greater than in those that do show some increase in lung cancer. In the former total admissions have risen by nearly 40 per cent. between 1909–13 and 1924–28, in the latter by 23 per cent. It is obvious that this change in the admissions may not equally affect all conditions. If, for the sake of argument, all lung cancers were admitted now and previously but to-day other morbid conditions are admitted which previously would not have been taken in, we should observe a declining proportion of lung cancers. As pointed out above, the denominator of the ratio is just as important as the numerator, and we can by no means be certain that it has not changed differentially. It might be argued that the lack of proportional increase in lung cancers in certain hospitals is due to the relatively greater number of admissions in recent years from other causes. That argument may be fallacious, but the point it places at issue is fundamental to the authors' case.

[1] Quart. Jour. Med., July, 1935, p. 321.

DECORTICATION OF THE HEART IN PICK'S DISEASE

THE clinical picture of chronic adhesive pericarditis complicating rheumatic heart disease is a familiar one. The diagnosis of adherent pericardium is commonly made when the degree of cardiac hypertrophy seems excessive, when heart failure is early and intractable, or when signs of adhesion between heart and chest wall are evident. In such cases it is assumed that adhesion to the rigid chest wall embarrasses cardiac systole, and surgical measures have been directed to removal of part of the bony wall in order to enable the heart to contract more completely.

There is, however, another and far rarer form of chronic thickening of the pericardium, first described as an entity by FRIEDEL PICK of Prague in 1896, which is inadequately and often incorrectly described in medical text-books, and which hitherto has seldom been recognised during life. Dr. PAUL WHITE of Boston, who came to England this summer to deliver the St. Cyres lecture of the National Hospital for Diseases of the Heart, made this rare form of chronic constrictive pericarditis the subject of his lecture. We are indebted to him for the most complete account of the disease yet published in this country.[1] Pick's disease consists essentially of a chronic thickening and induration of the pericardium, often with calcification. The heart is imprisoned in a rigid cage which prevents diastolic expansion, and soon leads to venous stasis. In contrast to the rheumatic type of chronic pericarditis, Pick's disease causes little or no enlargement of the heart, and murmurs are exceptional. The cardinal features of the disease consist of dyspnœa, œdema, engorgement of the neck veins, enlargement of the liver, and ascites. Abdominal swelling is often an early symptom, and in the absence of any objective sign in the heart may suggest cirrhosis of the liver. For this reason PICK used the term "pseudo-cirrhosis of the liver" in his description. Owing to the frequent occurrence of calcium deposits in the indurated pericardium, which can be detected by X rays, radiological examination of the heart is often of great value in diagnosis. A low blood pressure and a small pulse are also characteristic. The ætiology of Pick's disease is obscure; some cases are undoubtedly tuberculous, and in others there is a history of antecedent acute pericarditis of infective origin, but acute rheumatism apparently plays no part in the ætiology.

The importance of better recognition of Pick's disease lies not in its frequency, but in the discovery

[1] See THE LANCET, Sept. 7th, p. 539, and p. 597 of this issue.

of its amenability to treatment. Because the myocardium and the valves are not primarily involved, and are often relatively healthy, the cardiac function can be restored by removing the constricting pericardial cage. WHITE describes the operation employed to this end by Dr. E. D. CHURCHILL at the Massachusetts General Hospital, which consists essentially of resecting as much as possible of the indurated pericardium. Those who were privileged to see WHITE's remarkable film of the operation in progress are not likely to underestimate the magnitude or dangers of the surgical procedure involved. It is not one to be lightly undertaken, and calls for an experienced thoracic surgeon. The results of successful decortication of the heart in this way are however impressive. WHITE records 12 cases; of ten cases operated on by one surgeon, six were completely cured and one much relieved. His lecture should stimulate the interest of physicians in the diagnosis of Pick's disease and encourage thoracic surgeons to study CHURCHILL's work.

ANNOTATIONS

THE MATRIMONIAL CLINIC

A METROPOLITAN police-court magistrate offers to members of the medical profession a new, if limited, opportunity of social service. In his recent book, "Wife *v.* Husband in the Courts," [1] Mr. Claud Mullins explains that, in a proportion of matrimonial disputes in the police-courts, the good offices of a doctor are essential. Where sexual relations are the cause of the discord, Mr. Mullins believes it to be the only helpful course that the parties should be persuaded to discuss their troubles with a doctor before they embark on litigation against one another. Religious or moral appeal, he declares, will do little good. Constructive re-education in decent sexual standards is what is needed, and this task, he maintains, should not be assigned to laymen. He stipulates, however, that the doctors must be carefully selected; "unfortunately some of them have inhibitions and cannot help in cases of sexual difficulty." Lest the medical profession takes this reproach too much to heart, it may be added that elsewhere Mr. Mullins is equally critical of magistrates. A justice, he says, who has an excess of false modesty had better devote his or her attention to motoring summonses and avoid matrimonial cases. On the other hand he is aware of justices at the opposite extreme who, to quote his own words, find a sadistic pleasure in hearing about other people's sexual experiences or who belong to the school that finds sex at the base of all human actions. These too he recommends to absent themselves when husband and wife come to court.

Mr. Mullins's writings have shown him to be a reformer. His latest book sets out clearly the improvements he proposes. Some of them, commended in his final chapter, have already been passed into law with surprising promptness in the recent Money Payments (Justices' Procedure) Act. Others, which require no statutory authority, he has introduced in the south-western district of London where he himself sits. He has set aside, for instance, a special afternoon each week for matrimonial cases; in this way they are no longer mixed up with ordinary criminal business. He does his best to exclude the public and the newspaper reporters. Gossiping neighbours, he says, make trouble by repeating what they hear; and once a domestic story gets into the papers all chance of reconciliation may be lost. He knows how legal formalities and conventions perplex common folk. The police-court plan of putting one person in the dock and another in the witness-box may work well for a charge of burglary but is inconvenient for a matrimonial dispute. Mr. Mullins puts husband and wife on chairs facing him at an angle. They give their evidence comfortably from where they sit, instead of being marched about the room. They are encouraged to talk at their ease and are not pressed to cross-examine one another—a task of which the law optimistically believes all parties capable. By such devices the police-court becomes something like a matrimonial clinic. The magistrate of the old school confined himself to administering the law as he had received it, giving the applicants their remedy if the case was made out. The magistrate of the new school asks the probation officer to have a chat with the parties before the summons is heard. The old school conscientiously decided the relevant questions—Has desertion been proved? Has the husband wilfully neglected to maintain his wife? The new school postpones the answer to these questions till preliminary inquiry has exhausted the possibilities of healing the breach; it refuses to treat the summons as a declaration of war and the hearing as a dog-fight. It is in this scheme of informal investigation that Mr. Mullins seeks to enlist the doctor for "moral ambulance" work.

There is of course one obvious difficulty. The doctor will be told things which the magistrate would ordinarily never hear. Mr. Mullins appreciates that doctors will not receive confidences unless they keep secrets. At his own police-court, he says, professional confidence is respected and neither the magistrate nor the probation officer seeks to infringe it. In this work of informal preliminary investigation, by whomsoever it be undertaken, there is also a legal obstacle. The magistrate's decision must be based upon evidence given in open court; the private reports of an investigator, and the personal opinions he forms as to the rights and wrongs of the case, are not evidence. Mr. Mullins admits that the existing law prevents him from taking into account what the probation officer tells him in this way. An exception has been made for juvenile courts; special statutory rules allow the magistrate to receive and consider written reports furnished by probation officers without their being read aloud. The introduction of similar procedure for matrimonial cases is probably a long way off. Public opinion will hardly be persuaded of the propriety of inquisitions, however well-meaning, into English home life, and native caution will hardly encourage semi-official intervention between husband and wife. If meanwhile the progressively minded magistrate feels that his social work is thereby hampered, the doctor will be relieved to find that, if he has been able to help towards the sympathetic adjustment of domestic discords, he will not be expected subsequently to divulge the confidences entrusted to him.

[1] Wife *v.* Husband in the Courts. By Claud Mullins. London: George Allen and Unwin Ltd. 1935. Pp. 128. 3*s.* 6*d.*

OLIVE OIL LAVAGE IN CARBOLIC ACID POISONING

DISSATISFACTION with existing antidotes to acute phenol poisoning has prompted L. Goodman and A. J. Geiger[1] to an attempt to find a commonly available oil which will be more effective than liquid paraffin whose efficacy they regard as negligible. In their view alcohol also is disappointing as an antidote and may even do harm. Their search was limited to the true oils because of the readiness with which these oils are miscible with phenol, and of these olive oil appeared to be the most suitable because it is bland, cheap, and a household commodity. The minimum lethal dose (M.L.D.) of phenol was standardised on rats at 0·3 g. of phenol liquefactum per kg. of rat, and the protective value of various substances was then assessed against a dosage of one or two M.L.D. The first 45 experiments showed liquid paraffin administration to be ineffective, and subsequent experiments were devoted to studying the effects of olive oil, which was found greatly to raise the survival-rate of their rats if administered *before* the phenol. Administered *after* the phenol its value was not nearly so great unless it was used as the medium for gastric lavage.

Unfortunately they do not report any control experiments of lavage with plain water; in the absence of these, the criticism arises that the real reason for the benefit obtained with olive oil gastric lavage may have been the mechanical removal of the poison and that many other fluid media might have worked equally well. Most people with experience in the treatment of cases of acute poisoning hold that removal of the poison by thorough and painstaking washing out of the stomach is of far more importance than the administration of antidotes. Lavage properly performed entails the use of many pints of fluid. Goodman and Geiger have not tried olive oil in human cases. There seems no reason why it should not be tried as the fluid used in gastric lavage for carbolic acid poisoning, but there is no evidence to justify its use merely as a neutralising antidote without lavage.

THE WAYS OF THE LOCUST

IN a recent address to medical officers of health,[2] Dr. Dunstan Brewer urged his hearers to go to the locust and consider her ways; for there is a suggestive analogy between the appearance of plagues of locusts and of infectious diseases, and there is the possibility that the excessive multiplication of the locust that precedes migration is associated with insusceptibility to a natural agent which normally keeps the numbers down. The locust (as an economic problem) is very much in the air at the present time, and it is to be hoped that the laws which govern the devastating migrations of this insect will before long be understood. This much seems to be established. During the years in which locust swarms are absent, the insect is living a solitary life in certain "permanent habitats" under an outward form so different from its swarming cousin that it was long regarded as another species. Then something happens—it is generally believed to be a particular combination of favourable climatic conditions—and the locust population begins to increase. When this increase has reached a given level the insects tend to congregate, and in the course of a few generations (a generation takes about six weeks) they become transformed into a swarming phase which differs in form and coloration from the solitary phase of the same species as markedly as it does in temperament. Indeed there is some experimental evidence to prove that it is the restless activity of the densely crowded swarms which is directly responsible for their striking differences in form and colour. Once the migrating swarms are formed they are faced by legions of enemies. They are preyed upon by birds and mammals, attacked by insect parasites, subject perhaps to epidemic bacterial diseases, and assaulted by the traps, the dusts, and the poisons of locust officers. Ultimately these factors, combined maybe with a destruction of their own food-supply, gain the upper hand. The numbers decrease, the swarms are thinned out, and gradually the species reverts to its peace-loving solitary phase.

PERCAINE FOR SPINAL ANALGESIA

MOST anæsthetists who have persevered with the trial of the method of using percaine which was introduced by the late Dr. Howard Jones have come to regard it as extremely valuable. In the *Journal of the Canadian Medical Association* for August, Dr. F. Tempe records the result of 800 injections. He does not use the method on any patient with a blood pressure below 110 systolic, and he employs no preliminary injection except half a grain of ephedrine, a quarter of an hour before operation, in order to counteract the "hypotensive crisis of the twentieth minute, the result of the diminution of the vascular tone through paralysis of the sympathetic vasoconstrictors." Dr. Tempe refers to another precaution which is too often omitted. This is the immersion of the ampoules in warm water so that the solution is at body temperature when introduced into the spinal canal. It is highly probable that this device greatly reduces the likelihood of meningeal irritation. The amount of percaine which he uses does not exceed 15 c.cm. even for operations on stomach, biliary passages, or kidney. He finds that the 15 minutes' wait commonly recommended after injection can generally be curtailed, but he regards as a danger signal any complaint of headache or nausea in the first five minutes. The article includes other useful little tips of practice, and it is obvious that the success which Dr. Tempe has enjoyed is the reward of a careful as well as highly intelligent employment of a method excellent in itself but easily misused.

AN UNSUSPECTED OCCUPATIONAL HAZARD

ACCOUNTS come from two independent sources of an occupational risk previously unsuspected. It may arise in the process of electro-welding or in using oxy-acetylene burners, when, in either case, work is being carried on in a confined and badly ventilated space. Careful research at the Harvard School of Public Health[1] has revealed that during these processes nitrous fumes are generated from combination of the atmospheric gases. Hence arises an insidious and far more serious hazard than that of metal fume fever with which it has been confused, the confusion having arisen from the fact that sometimes galvanised surfaces are being treated by the welding flame when zinc oxide is boiled off. Metal fume fever, also known as brassfounders' ague, does no lasting harm; its effects are not cumulative; and the substances causing it, such as the oxides of zinc and magnesium, are not true industrial poisons. The inhalation of nitrous fumes is

[1] Amer. Jour. Med. Sci., 1935, cxc., 206.
[2] Royal Sanitary Institute Health Congress, Bournemouth, July 17th, 1935.

[1] Titus, Warren, and Drinker: Jour. Indust. Hyg., July, 1935, p. 121; Williman, F. L.: Ibid., p. 129; Drinker, Warren, and Page: Ibid., p. 133.

different; the risk is insidious, as the fumes can be breathed without much immediate inconvenience; but a few hours later pulmonary œdema supervenes and not infrequently ends fatally. Such was the fate of animals exposed sufficiently to the fumes from electro-welding. A fatality is reported from America of a man employed in the basement of an apartment house at electro-welding the two halves of a galvanised hot-water tank. In this country no less than 17 other cases, one being fatal, are reported [2] following the use of large oxy-acetylene burners for the purpose of heating a heavy steel crosshead in order to remove it from the rudder post in a confined space on board a large liner. Here then is a hazard which, when once its existence and nature are recognised, may easily be avoided. Either the workplace may be well ventilated, or the fumes may be removed by local exhaust, or suitable respirators or air masks may be worn.

CAUSATION AND TREATMENT OF MORPHINE ADDICTION

A NOVEL theory of morphine addiction and of the symptoms which may attend the withdrawal of the drug has been advanced by Dr. Iwan I. Ostromislensky, of New York, formerly professor of organic chemistry in the University of Nijni-Novgorod. His theory of addiction propounded is based on analogy with anaphylaxis. Morphine, it is suggested, generates an antigen and the antigen produces an antibody which appears on about the twentieth day after daily administration. The withdrawal of morphine from an addict, on this assumption, will leave the antigen to react on its antibody and occasion symptoms of anaphylactic shock, accompanied by a "craving" for the drug, which if unrelieved may result in collapse and death. This theory of addiction has led Dr. Ostromislensky to advocate the employment of a new synthetic preparation (diphenylmethylpyrazolonyl) as a "valuable therapeutic for the unfortunate morphine addicts." It is claimed that the new remedy, which has been named "rossium," relieves the craving, checks the withdrawal symptoms, and overcomes addiction to the drug. In a communication to the Russian Medical Society in New York [3] it is stated that the remedy is being tested in hospitals and sanatoria in the United States and in Canada.

MARRIAGE OF SYPHILITICS UNDER TREATMENT

ONE of the urgent questions put to their doctors by adult male patients suffering from syphilis is when intercourse is to be allowed. The conservative practitioner usually allows marriage without restrictions after a period of three to five years of treatment and observation. When the biological urge is very great intercourse is usually permitted after a shorter period to men with negative Wassermann reactions provided that they are actually receiving arsenical injections at the time and that they wear a condom as a protection against seminal infection. That this latter may occur has been shown not only experimentally in monkeys but also by demonstrating spirochætes in human semen by the dark-ground method. In a recent investigation [4] the infectivity was tested of the semen of 25 syphilitic patients, 5 acute and 20 chronic, all under treatment with arsenic or bismuth or both. The semen was collected aseptically and was injected into the testicles of two rabbits within half an hour of ejaculation. After three months of negative observation by dark-ground illumination of puncture fluid taken from the testicles of the rabbits, their inguinal glands were ground up and passaged into two fresh animals, who were similarly observed. In no case was there any demonstrable lesion or spirochætes. The authors draw the conclusion that the syphilitic is not infectious for so long a period as is generally thought, and that marriage might safely be allowed at an earlier period. This conclusion seems to us unwarrantable, being based on 25 cases in which only one examination was made, and that presumably whilst the case was under treatment. Once intercourse is allowed it is unlikely that the average patient will confine himself to specified periods—i.e., during courses of injection—and there is nothing in the experiment to show how long the semen remains safe. D. Nabarro in this country has shown cases where the birth of normal children, conceived after the parents have had some treatment, was followed by the birth of a syphilitic child as the result of a relapse of the disease, or the awakening of a latent syphilis. It would therefore seem wiser to continue to insist on fully three years of treatment and observation before allowing marriage. Greenbaum and his collaborators suggest that their method of examining semen might be of value as a method of testing syphilitic men who insist on marriage before they have had adequate therapy. The test would certainly be a useful adjunct to venereal practice if it proved to be reliable after the first animal inoculation, and the passage into the second animal, which adds another three months to its duration, could be dispensed with; further trial would be essential before this could be assumed, and even then the cautious physician would insist on at least two negative results.

VITAMIN C AND ASCORBIC ACID

OUR leading article of August 24th touched only briefly on the identification of vitamin C with ascorbic acid, and the account given by Mr. S. S. Zilva, D.Sc., in the August *Archives for Disease in Childhood* deserves a further note. The discovery is one which illustrates the intimate relations of chemistry and medicine. Briefly it arose out of two apparently unconnected observations; one the isolation from the adrenal cortex (in 1928, by Szent-Györgyi working in Gowland Hopkins's laboratory) of a strongly reducing hexose derivative, called by him hexuronic acid; the other the elaboration of a test by the late J. Tillmans of Strasbourg to discriminate between lemon juice made from fresh lemons and spurious imitations thereof. Tillmans's test consisted in using 2:6 dichloroindophenol as an indicator, this being decolorised by the real, but unaffected by the artificial, lemon juice; and he came to the conclusion that the substance which reduced the indicator was vitamin C. Hexuronic acid was also found to decolorise 2:6 dichloroindophenol; Tillmans suggested that it was probably identical with vitamin C; and in 1932 Szent-Györgyi actually proved that it had anti-scorbutic powers. Then came a series of investigations in the chemistry department of the University of Birmingham by W. N. Haworth, E. L. Hirst, and others, with the following results: (1) the hexose derivative obtained by Szent-Györgyi was found by Haworth and Szent-Györgyi to contain a molecule of water less than is required for a hexuronic acid, and the name ascorbic acid was suggested in its stead; (2) the structural formula of ascorbic acid

[2] Annual Report of the Chief Inspector of Factories for 1934. London: H.M. Stationery Office. 1935. Pp. 68–69.
[3] Medical Record, 1935, cxli., 556.
[4] Greenbaum, S., Katz, S., and Rule, A.: Amer. Jour. of Syph. and Neur., 1935, xix., 210.

was elaborated; (3) in conjunction with Zilva the antiscorbutic power of ascorbic acid was shown to be a property of the acid and not of any associated impurity; and finally, (4) *l*-ascorbic acid was synthesised from *l*-sorbose. The synthesis of *l*-ascorbic acid was also carried out and published earlier in the same month by T. Reichstein of Zurich, but his method is not so simple as Haworth's which also has the advantage of being quite inexpensive. L. G. Parsons and P. Schultzer in 1933 reported the cure of scurvy with ascorbic acid obtained from natural sources,[1] and A. D. C. Bell, Parsons, and others have since proved the antiscorbutic powers of synthetic products.[2]

RHODA ERDMANN

THE death was announced last week in Berlin of Prof. Rhoda Erdmann—well known as one of the pioneer workers in tissue culture. Prof. Erdmann began her scientific career as a protistologist. Just before the outbreak of the war she went to America and worked at Princeton and Yale; her interest was aroused in tissue culture, which became her life work. On returning to Germany she was appointed head of the department of experimental cytology of the University Institute for Cancer Research in Berlin, and later was elected professor in the medical faculty of the university. From her laboratory there emerged numerous valuable contributions to the study of growth in vitro, with special reference to malignant growth. In 1922 she published a book entitled "Praktikum der Gewebepflege oder Explantation besonders der Gewebezüchtung," which outlined in detail a complete course of instruction in tissue culture for university students. Prof. Erdmann was perhaps best known to biologists as the founder and editor of the *Archiv für experimentelle Zellforschung besonders Gewebezüchtung* (*Explantation*), which under her able direction became the recognised international medium for the publication of researches in tissue culture. She took the leading part in organising the International Congress for Experimental Cytology, and was present in this country at the third meeting of this congress at Cambridge in 1933. At that time her health was the cause of anxiety to her many friends, who admired the courage and enthusiasm which have sustained her in her work during recent years in the face of many difficulties.

IMMUNISATION AGAINST TETANUS

PASSIVE immunisation of the wounded during the war had an immediate and striking effect in lessening the incidence of tetanus. For every 20 cases before, only one occurred after this method was in general use, and those that did occur were mainly mild and chronic. In spite of its comparative success, passive immunisation has certain disadvantages which were pointed out in a letter addressed to our columns[3] two years ago by Mr. H. H. Brown. Of these the chief are: (1) that antitoxin may not always be available, (2) that horse-serum sensitises to foreign protein, and (3) that its protection may pass off too soon. To these should be added another: that tetanus may follow slight wounds for which antitoxin would probably not be given. Active immunisation is free from these drawbacks and Mr. Brown pointed out that there is no adequate reason why it should not be generally employed to protect against tetanus as it is against diphtheria and scarlet fever. For some time past this method has been used officially in the French army, antitoxin being given with the first injection of toxoid, followed by two further injections of toxoid alone at intervals of two or three weeks, when any sort of wound has been inflicted. Mr. Brown would extend its use and suggests the active immunisation against tetanus of all soldiers before they are called out on active service, especially in countries where tetanus is prevalent.

In a recent paper[4] Dr. P. A. T. Sneath and Mr. E. J. Kerslake, working at the Connaught Laboratories, Toronto, have studied the persistence of antitoxin after active immunisation. Serum was obtained from 13 persons two years after the last of a series of three injections of tetanus toxoid. These observers found that the residual antitoxin showed no sign of having fallen below the level found from 12 to 15 months after the last dose (between 0·025 and 0·1 unit per c.cm. of serum). Further, when a secondary stimulus of 1 c.cm. of toxoid was given to these patients it effected a definite increase of titre within a week, and this persisted at significantly high levels after one month. In 12 patients treated in this way, within a week of the last injection of toxoid, five showed 5 or more units per c.cm., two showed 2·5 units, three at least 1 unit, one between 0·1 and 0·5 unit, and one 0·01 unit per c.cm. of serum. The amount of antitoxin so produced fell slightly in some after another month, but persisted at significantly high levels. Titres similarly attained in another group of patients were shown to persist at or above the level of 0·1 unit per c.cm. in nine out of ten patients. The level of 0·1 c.cm. to 0·25 unit per c.cm. of serum represents the maximum antitoxin level reached in the blood-serum of patients injected with 1500 American units of antitoxin.

These observations lend support to Mr. Brown's contention that active immunisation against tetanus for soldiers before they are called out on active service may prove more efficient than the passive method hitherto employed.

"PROGNOSIS"

THE first 66 articles of the series on Prognosis now appearing in our columns have been collected in book form, following the practice adopted for the earlier series on "Modern Technique in Treatment" and "Clinical Interpretation of Aids to Diagnosis." In the volumes previously issued the articles were printed in the order in which they had appeared in THE LANCET; in the volume on prognosis, which is published this week, they have been classified into systematic groups to facilitate quick reference. These groups serve also to suggest gaps which will be filled, so far as is possible, as the series proceeds.

Dr. John Ryle, physician to Guy's Hospital, has been appointed regius professor of physic in the University of Cambridge in succession to Sir Walter Langdon-Brown, who is retiring on Sept. 30th on completion of his term of office. Since King Henry VIII. founded the chair in 1540 all the regius professors except one have held medical degrees gained at Cambridge. The exception was John Blyth, the first regius, who took his M.D. at Ferrara. The twenty-first regius is a London graduate and the first Guy's physician to be thus honoured. To find a younger regius we should have to go back more than a hundred years.

[1] See THE LANCET, 1934, i., 427.
[2] Ibid., 1935, i., 547, 999.
[3] Ibid., 1933, ii., 1509.
[4] Brit. Med. Jour., 1935, ii., 290.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXVIII.—PROGNOSIS IN FIBROIDS

THE extended scope of myomectomy which has been developed during the last two decades has brought with it a considerable increase in our knowledge of fibroids. It would appear that in most cases the tumours as "seedlings" are laid down somewhere between the twenty-fifth and thirty-fifth years of the woman's life, and that after that period further formation of seedlings is uncommon. Fibroid forming is therefore to be regarded as a phase in the life-history of the uterus rather than a habit, and in this respect fibroids are analogous to gall-stones, the formation of which is also a phase rather than a habit. This is fortunate, otherwise the operations of cholecystotomy and myomectomy would be inadequate, for new stones or new fibroids would begin to be formed very shortly after the respective operations, whereas the recurrence of stones after cholecystotomy only takes place in 7 per cent. of the cases, and recurrence of fibroids after myomectomy in only 5 per cent. of the cases.

AGE AS A FACTOR IN PROGNOSIS

Though the ten years from 25 to 35 can be looked upon as the "normal" period during which fibroids may begin to form, there are certain patients in whom they begin earlier, and certain others in whom they begin later.

The growth of a fibroid is at first slow, but as it enlarges the rate tends to increase. It is probable, however, that a fibroid does not commonly give rise to any symptoms or gross signs until five years or more have elapsed from its incipience. The chief exceptions to this rule apply to submucous fibroids, which, by reason of their position, may early give rise to menorrhagia. It is generally assumed that fibroids grow faster the younger the woman, but rapid growth is often observed in the relatively aged.

Relation of age to rapidity of growth.—It is excessively rare for fibroids to be discovered in a woman below 20 years of age, and I personally have never seen them under 19, though their presence in children has been recorded. From 20 to 25 they are still rare, but from 25 to 30 they are met with much more often, though they are still comparatively uncommon. The bulk of patients presenting themselves for the first time with fibroids are between 35 and 50 years of age. When fibroids are discovered in a patient under 25 an abnormal fibroid-forming tendency on the part of the uterus must be inferred.

We have no knowledge as to why some fibroids grow slowly and some relatively quickly. It is generally held that the more vascular the uterus the faster will a fibroid grow, and the effect of pregnancy is cited as a proof of this. It is however doubtful, to my mind, whether pregnancy does have this effect. Certainly much of the enlargement is merely apparent, being due to the hypertrophy of the uterine wall over the tumour. It is, further, a remarkable fact that high vascularity of the uterine wall is usually associated with degenerative changes in the fibroid or fibroids which it encloses. These degenerative changes are necrobiotic in character, the unstriped muscle-fibres of the tumour undergoing a hyaline swelling and softening which may end in complete diffluence, and pari passu with this change large irregular blood sinuses make their appearance in the substance of the tumour. As a result the tumour enlarges, but the enlargement is due to swelling of the fibres and influx of blood, and not to growth in the strict sense of the word. It appears to be an absolute rule that fibroids never form de novo after the menopause, and an almost absolute rule that they do not continue to grow after that event, or even enlarge from causes other than growth, for (excluding malignant transformation) such a happening is limited to the rare occurrence of cystic degeneration. Uterine tumours appearing after the menopause are practically always due to some form of malignant disease, and should be so diagnosed, no matter how much their consistence and shape suggest fibroids.

As far, then, as the rate of growth is concerned, age is an important factor in prognosis only when the patient has passed her menopause, for before this event there is no certain relation between rate of growth and age. It is obvious that the younger the patient the longer time is there for the tumour to grow: a tumour the size of a golf-ball discovered in a woman of 50 is unlikely to attain any great size, simply because, short of unusually rapid growth, there is not time enough before the menopause for it to do so, but a tumour of the same size discovered in a young woman of 30 is practically certain to become large because it has 20 to 25 years in which to grow. In this connexion, it is to be remembered that fibroids postpone the menopause, and patients possessing them most frequently do not experience it until well after their fiftieth year.

Effect of size on symptoms.—Speaking generally, the larger the tumour the greater the likelihood that it will produce symptoms, if it is not already producing them. On the other hand, small tumours may produce marked symptoms and very large ones practically none at all. Some of the largest that the surgeon has to deal with have been thus symptomless for years, so that time has been given them to attain a remarkable size. This particularly applies to broad-ligament fibroids, a variety which has yielded by far the greatest proportion of the giant fibroids weighing anything up to 50 lb. that can be found recorded in the literature.

FACTORS INFLUENCING PRODUCTION OF SYMPTOMS

The prognosis of fibroids, in so far as the likelihood of their producing symptoms is concerned, is largely governed by the age of the patient: the younger the woman the greater the likelihood. There are other points, however, to be considered. The commonest symptom is menorrhagia, and its occurrence is the more likely the more the tumour approaches the cavity of the uterus—that is to say, when the fibroid is submucous. A submucous fibroid causes symmetrical enlargement of the uterus, and hence when this is present the probability of menorrhagia developing (if it has not already done so) is greater than when the uterus presents bosses and irregularities indicating a subserous location. On the other hand, fibroids are more commonly multiple than solitary, so that the undoubted presence of subserous tumours does not exclude the possibility of the uterus containing a submucous tumour. Further, subserous tumours when large quite commonly cause menorrhagia because they increase the general vascularity of the organ.

Menorrhagia, once established, almost always gets worse with time, and the menopause-delaying effect of fibroids is important in this connexion. Patients bled white by the long continuance of excessive periods sometimes state that they lose less than they used to do. They do, because they have so little blood to lose, but when considered in relation to their anæmia the periods are just as excessive or more excessive than ever. It is noteworthy that so soon as the blood content is increased by the administration of liver and iron the amount lost is increased. The attempt to augment these patients' blood content is like trying to fill a bottle with a hole in it. Symptoms due to pressure are most likely to develop quickly when the tumour is growing low down in the uterus, especially when it is situated in the supravaginal cervix. Frequent urination is the common symptom, and later on attacks of retention. Tumours outside the pelvis do not give rise to pressure symptoms until they have attained a great size and sometimes not even then. Degenerative changes may give rise to acute symptoms, but it is impossible to gauge the likelihood of such a happening in any individual case of fibroids, as our knowledge of the cause of these degenerations is insufficient; all that is certainly known being that pregnancy conduces to such changes very markedly, and particularly to that form of necrobiosis to which the adjective "red" is applied. Fibroids are less likely to degenerate after the menopause, but calcareous degeneration is common in old women and can give rise to symptoms. Torsion of a fibroid is a rare event and could only affect one that was subperitoneal and pedunculated.

RELATION OF FIBROIDS TO CHILDBEARING

The prognosis of fibroids as regards childbearing can be approached from two angles: the effect of the tumours on childbearing and the effect of childbearing on the tumours. Speaking generally, fibroids militate against pregnancy, and the more so the more deeply they are placed. Their effect on labour depends on their situation. Small superficial tumours do not interfere with the event, but large, deeply placed tumours may bring about miscarriage or distort the lie of the child, or cause actual obstruction.

Pregnancy has an adverse effect on fibroids chiefly because it induces acute degeneration in them. The question whether it increases their rate of growth has already been dealt with, but whether it does or does not, the united bulk of the tumour and the pregnancy makes the uterus abnormally large. In any case of fibroids the possibility of pregnancy is a strong indication for the removal of the tumour before the event.

CHANCES OF MALIGNANCY

In any discussion on the prognosis of fibroids the chances of malignancy are an important part of the consideration. There are three possibilities: (1) a tumour deemed to be a fibroid may, in fact, be a malignant growth; (2) a fibroid may undergo sarcomatous change; and (3) a carcinoma may develop in a myomatous uterus.

As regards (1), it is to be remembered that it is only in a proportion of fibroids that the medical man can be absolutely certain of the nature of the mass he feels, and that other enlargements of the uterus and certain enlargements of the ovaries or tubes can very exactly simulate the contour and consistence of fibroids. This particularly applies to malignant disease of the ovaries occurring in elderly women, and this is frequently mistaken for fibroids. "Fibroids" first declaring themselves after the menopause are rarely fibroids.

(2) Sarcomatous change is said to occur in 2 per cent. of all cases of fibroids that come to operation, but in my experience this estimate is too high. It is an uncommon event, and such samples as I have seen have mostly been in women who have been known to have fibroids for years but who have been advised against or declined an operation. The advent of malignancy is insidious, being only accompanied by vague pain and discomfort in the pelvis. In most of the cases there has been no suspicion of gravity before the operation, and the microscopical findings have come as a surprise. The outlook is bad, for recurrence after removal is common.

(3) I have no doubt that fibroids predispose to carcinoma of the body of the uterus, for so many of the patients I have operated on for the latter condition have been found to have them. Moreover, corporeal carcinoma is very rare in women before the climacteric; but, in almost all the examples I have had experience of, the malignant growth was associated with fibroids. Carcinoma of the cervix is a rare complication of fibroids because the latter make for sterility, whilst the former is almost limited to parous women.

TYPE OF OPERATION

Finally, we must consider the prognosis of fibroids in relation to operative removal. Of the three operations, myomectomy, subtotal hysterectomy, and total hysterectomy, the operative case-mortality of myomectomy and subtotal hysterectomy is about the same (1 per cent.), whereas that of total hysterectomy is somewhat higher. These figures, of course, apply only to surgeons expert in this class of work. Total hysterectomy removes all possibility of further fibroids, but a few cases are on record in which after the subtotal operation a fibroid appeared in the conserved cervix. It is a most unusual event.

My own figures show that after myomectomy fresh tumours form in the conserved uterus in less than 5 per cent. of the cases, and to the extent of requiring further operation only in less than 3 per cent. The liability is greatest when myomectomy is carried out on young patients, particularly when the uterus contains a number of tumours, for in such persons, as I have already pointed out, a special predilection must be inferred. For example, I once removed 92 fibroids from the uterus of a girl of 19, but within a few years the uterus had to be removed on account of fresh tumours. On the other hand, it is in young women that preservation of the uterus is peculiarly desirable.

CHILDBEARING FOLLOWING MYOMECTOMY

The childbearing value of the conserved organ is considerable, as the following shows:

Out of 77 women on whom I performed myomectomy and who subsequent to the operation desired to have children and were in a position to have them, no less than 30 had conceived by the time I collected these figures. Of these 30 women 26 had conceived once, 2 had conceived twice, and 2 had conceived three times. The manner of delivery was as follows: of the 26 who had conceived once 18 delivered themselves naturally, 6 had Cæsarean section, and 2 miscarried. Of the 2 who had conceived twice, the deliveries were all natural; whilst of the 2 who had conceived three times the deliveries in one case were all natural, while the other had one natural delivery and two Cæsarean sections. The frequency of Cæsarean section is accounted for by the fact that, many

of the patients being elderly, it was specially important to obtain a living child.

In conclusion, the following case is worth recording as showing the possibilities of childbearing after myomectomy even in extreme cases. In 1922 I removed seventeen fibroids from the uterus of a nullipara of 27 who was very anxious to have a child. Seven years afterwards I operated again on account of menorrhagia and abdominal pain. Six new fibroids were removed, and in addition "chocolate cysts" were enucleated from both ovaries. In 1934 pertinacity was rewarded, for she became pregnant, and this year I delivered her of a living child by Cæsarean section.

VICTOR BONNEY, M.S., B.Sc., F.R.C.S., F.R.A.C.S.,
Gynæcological Surgeon to the Middlesex Hospital.

SPECIAL ARTICLES

MALIGNANT DISEASE IN THE NATIVES OF KENYA

BY F. W. VINT, M.D., B.Sc.

(*From the Medical Research Laboratory, Kenya*)

THE following observations may be useful as a contribution to our knowledge of cancer in races living in a primitive environment.

In 2378 tissues from the natives of Kenya, examined for all conditions, I have found 546 (or 23·8 per cent.) with malignant change. The tumours found are given in Table I., and the data assume

TABLE I.—*Analysis of the Tumours Found* (546)

Type.	No. and per cent.	Smith and Elmes [1] Nigeria percentage.
Carcinomata*	277 (50·7)	48·6
Sarcomata†	178 (34·4)	36·0
Melanomata	59 (10·8)	8·0
Endotheliomata	15 (2·7)	3·4
Teratoblastomata	14 (2·5)	0·4
Chorion epitheliomata	2 (0·3)	0·2
Hypernephromata	1 (0·1)	—

* Including 10 mixed tumours of the parotid.
† Including myeloid sarcoma.

greater importance for native races in general if they are considered in conjunction with those of Smith and Elmes [1] for the natives of Nigeria, quoted in the right-hand column.

The most striking features of this Table are :—

(*a*) The close agreement between the figures for the natives of Nigeria and those of Kenya.

(*b*) The high ratio of sarcomatous to carcinomatous growths—namely, 2 : 3. The International Year Book (1929) [2] shows that the combined returns for England and Wales, Scotland, and Northern Ireland give a ratio of sarcomata to carcinomata of 1 : 17. In these figures for Europeans no mention is made whether or not melanomata are included with the sarcomata. If one combines these two types of tumours in the native the ratio becomes 1 : 1·6.

(*c*) The large number of melanomata seen in the African. Malignant melanomata in the African have been discussed in a recent paper by Sequeira and myself,[3] and require no further amplification here.

TABLE II.—*Types of Carcinoma* (277)

Type.	No. and per cent.
Glandular	141 (50·9)
Squamous celled	134 (48·4)
Basal celled	2 (0·7)

The types of carcinomata seen are given in Table II. and the distribution of the growths in Table III. In each case the percentage given is the percentage of the carcinomatous growths and not of the total malignant tumours.

TABLE III.—*Site-incidence of Carcinoma* (277)

Site.	No. and per cent.	Site.	No. and per cent.
Limbs (skin)	64 (23·1)	Pancreas	6 (2·1)
Liver, primary	38 (13·7)	Trunk (skin)	6 (2·1)
Glands (lymph)	29 (10·4)	Stomach	5 (1·8)
Breast	25 (9·0)	Liver (secondary)*	4 (1·4)
Lip, mouth, and palate	17 (6·1)	Abdominal cavity*	4 (1·4)
Face and head	15 (5·4)	Larynx, kidney, œsophagus, rectum, thyroid, bladder (each)	2 (0·7)
Genitalia { male	15 (5·4)		
Genitalia { female	13 (4·6)		
Parotid gland	10 (3·6)	Unspecified	14 (5·0)

* Site of primary growth not stated.

The types of sarcomata are given in Table IV. and the site-incidence in Table V.

TABLE IV.—*Types of Sarcoma* (178)

Type.	No. and per cent.	Type.	No. and per cent.
Round-celled sarcoma	64 (35·9)	Osteosarcoma	10 (5·6)
Spindle-celled sarcoma	58 (32·5)	Chondrosarcoma	3 (1·6)
Mixed-celled sarcoma	24 (13·4)	Myxosarcoma	3 (1·6)
Myeloid sarcoma	14 (7·8)	Liposarcoma	1 (0·5)
		Oat-celled sarcoma (mediastinum)	1 (0·5)

TABLE V.—*Site-incidence of Sarcoma* (177)

Site.	No. and per cent.	Site.	No. and per cent.
Limbs	65 (36·5)	Breast, kidney, liver (each)	4 (2·2)
Glands	14 (7·8)	Eye	3 (1·7)
Mouth and jaw	14 (7·8)	Intestines	2 (1·1)
Bone (unspecified)	8 (4·6)	Uterus, vulva, spleen, lung, mediastinum (each)	1 (0·6)
Ribs and chest wall	8 (4·6)		
Face and head	7 (3·9)		
Testicle	7 (3·9)		
Neck	7 (3·9)	Unspecified	20 (11·2)
Retroperitoneal	5 (2·8)		

EPITHELIOMATA

From the figures given in Tables II. and III. it appears that malignant growths of the skin are of the utmost importance in the East African native. Among the glandular carcinomata 4 cases were diagnosed as tumours of the sweat glands; these taken in conjunction with 2 rodent ulcers, 59 melanomata, and 134 epitheliomata show that cancer of the covering membranes accounted for 36·4 per cent. of the malignant growths found. It is significant that although epithelial tumours are so common in the African, yet basal-celled cancer, so common amongst the white races, has only been diagnosed twice in 546 tumours. Smith and Elmes in Nigeria found 7 in 500 tumours. Yet rodent ulcers are often seen in the white population in East Africa.

The large number of squamous-celled cancers is due to the prevalence of malignant changes in chronic tropical ulcers of the leg, 73 of the epitheliomata being associated with this condition. In an attempt

to investigate tropical ulcers from a histological viewpoint, a routine series of examinations was carried out. Through the courtesy of Dr. Procter and Dr. Hargreaves, of the Kenya Medical Service, 282 ulcers excised in a native reserve hospital were obtained. These were an unselected routine series removed from both sexes of all ages, the doctors concerned considering that excision followed by skin-grafting offered the best hope of a cure within reasonable time in general hospital work. In these 282 ulcers were found 1 melanoma almost devoid of pigment, 5 epitheliomata, and 3 cases in a definite precancerous condition. Thus excluding the pre-cancerous conditions 2 per cent. of a routine series of chronic tropical ulcers were found to be malignant. The Annual Medical Report, 1932, for Kenya Colony [4] shows that among in-patients and out-patients treated at the Government native hospitals over 18,000 were seen in one year.

While examining the ulcers one was impressed with the aberrant overgrowth of the marginal epithelium. This was so striking that it is doubtful if any two observers would agree on the number showing precancerous changes. Two main factors appeared to be involved in limiting the atypical overgrowth: (*a*) the dense bed of well-developed fibrous tissue forming the base of the ulcer; and (*b*) fibrosis of the blood-vessels in the ulcer.

During the investigation it was found that 11 per cent. of the ulcers showed foreign bodies or foreign body giant cells. This must be regarded as a high incidence, for only two pieces of tissue were blocked and sectioned from each ulcer and the ulcers varied in size up to 6 or 7 inches in diameter. The foreign bodies were a clear, hyaline, structureless-looking material, and in one ulcer portions of an unidentified worm were found.

BREAST AND GENITAL ORGANS

Malignant disease of the *breast* is not uncommon in the East African native, 25 carcinomata and 4 sarcomatous growths being seen, a percentage of 5·3 of the malignant tumours. Of these, 5 carcinomata and 2 sarcomata were from males. Among the female cases there were 2 cases of epitheliomata and 1 case of Paget's disease of the nipple.

Male genital organs.—The 15 cases seen included 9 cases of epitheliomata of the penis. These were all derived from uncircumcised natives. Circumcision is practised by most of the tribes in Kenya, the operation being performed about the age of fifteen years. Wolbarst [5] states that the morbidity-rate of penile cancer in the United States is at least 2 per cent. and possibly 3 per cent. of all cancer in the male and draws attention to the rarity of the condition in the circumcised. In Kenya where epithelioma is the common form of cancer no case of this disease of the penis was found in a circumcised native.

Among the tumours of the *female genital organs* only 1 case of carcinoma of the body of the uterus was found. One case of sarcoma of the uterus was also seen. Smith and Elmes in their series only had 2 cases of cancer of the uterus and 1 myosarcoma. Thus in 502 cases of carcinomata from Africans only 3 were uterine growths. As in other organs, epitheliomata accounted for the majority of the growths of the female genitalia.

TUMOURS OF THE LIVER

Cazanove [6] states that in French West Africa cancer of the liver is commoner than cancer of any other organ. Snijders and Straub [7] found the same condition of affairs in Javanese coolies working in Sumatra. Strachan,[8] discussing autopsy findings among the Bantu races in South Africa, found the liver to be the commonest site of primary carcinoma accounting for no fewer than 37 out of 73 epithelial tumours. Smith and Elmes had 32 in their series. In the East African 13 per cent. of the epithelial tumours were of primary hepatic origin. The high incidence of this type of growth is best illustrated by autopsy records. In 1100 consecutive post-mortem examinations, the great majority of which were on patients thirty-five years or under, 24 malignant growths were found. Of these, 16 were epithelial and included 8 primary carcinomata of the liver.

Of the 37 cases seen, microscopical examination showed that 31 were liver-celled growths and the remaining 7 bile-duct in origin. The outstanding feature of the livers in which there were growths was the cirrhosis present, usually of a hob-nailed variety. This point has been noted by the various authorities quoted in this article. The relationship between cirrhosis and primary carcinoma cannot be considered a casual one, and it would appear doubtful that the cirrhosis is secondary to the new growth. In a previous paper I pointed out [9] that 67 in 100 livers, removed at consecutive post-mortem examinations from patients of all ages, showed cirrhosis of one form or another. In addition, 16 of the 100 livers exhibited fatty degeneration. Thus in considering cancer of the liver in the East African native it must be borne in mind that one is dealing with an organ extensively diseased before the onset of any malignant changes.

Of the 8 carcinomata seen on the post-mortem table none showed metastases in other organs, the growths being confined to the liver itself.

TUMOURS OF THE INTESTINES

As can be seen from Table III. malignant disease of the intestinal tract is not common. Two cases of carcinomata of the rectum have been seen and 2 of secondary nodules in the abdominal cavity, which from their histological appearances may have been derived from an adenocarcinoma of the rectum. In these 2 latter cases the site of the primary growth was not stated.

Cancer of the stomach, like gastric ulcer, appears to be rare in the East African. In the 1100 autopsies to which reference has been made only 2 cases of gastric ulcer were seen and 1 case of a healed duodenal ulcer.

GENERAL

The tumours examined have been received from native hospitals throughout Kenya and are representative of the native population as a whole. They cannot, however, be taken as statistics for the incidence of cancer. The tumours seen in the Medical Research Laboratory, Nairobi, represent only a small proportion of the tumours found throughout the Colony, and presumably the medical officers in the native reserves see only a proportion of the sick in their district. This will be appreciated when it is understood that a medical officer may have under his charge a district of 3000 square miles and a population of 300,000, and for assistance a few indifferent native dressers.

No mention has been made of the age-incidence of malignant disease in the native. Such records as one possesses are useless, since no registration of births or deaths is carried out in the native reserves and it is impossible to obtain accurate ages from the natives themselves; the figures we have represent an estimate by the medical attendant. However,

personal experience and the consensus of opinion of the medical officers from whom inquiries have been made seems to show that the onset of cancer is at an earlier age in the native than in the European, the maximum age-group being 30–40 years. This may be a factor in the high ratio of sarcomatous to carcinomatous growths.

The natives in the reserves in Kenya have been touched only lightly by civilisation. They live under conditions of filth and squalor. Sanitation is almost non-existent as yet and the main food is maize meal. Meat is eaten when available, but this is rarely, since cattle are regarded as currency.

CONCLUSIONS

These observations provide further evidence against the theory that cancer is rare among indigenous peoples living under natural and primitive conditions. As yet only a negligible proportion of the population of Kenya live under "civilised" conditions; but analysis shows that malignant disease is far from rare among them. The distribution in the body differs materially, however, from the distribution recorded in the European.

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MEDICINE AND THE LAW

Diabetes Treatment by Unqualified Practitioner

AT a Camberwell inquest last week, where death was found to have been due to diabetes, the South London coroner described the treatment as "arrant rubbish" and the unqualified practitioner who had administered it as a "quack." Sir Bernard Spilsbury gave evidence that the medicine prescribed by this practitioner would have no appreciable effect; it was simply useless. The coroner explained to the jury that, had there been evidence that the treatment had shortened life, a verdict of manslaughter would have been proper. As there was no such evidence (the medicine having no more effect than so much water), a verdict of death from natural causes was returned.

The deceased, a woman aged 32, had suffered from diabetes for several years. She had originally been treated by a duly qualified doctor; he was called in again shortly before her death when she was in a state of coma and a death certificate was likely to be required. The unqualified practitioner who treated her had a plate outside his "surgery" in Peckham Rye which bore the words "Dr. William Mellor, Osteopath, U.S.A., Homœopath, India." He told the coroner that he had obtained a degree in osteopathy at the First National University, Washington, New Jersey, and was an associate of the Western University, Kapurthala, India. "Would you be surprised to hear," inquired the coroner, "that there is no such place as the Western University, Kapurthala, but merely a place which issues diplomas on payment of a fee?" Mr. Mellor replied that the information would surprise him; he had not studied in India but had sat for the examination in homœopathy in London "under the Indian Education Scheme." He explained that he called himself a doctor because of his doctorate of osteopathy; he did not practise as a physician and was not a surgeon or a general practitioner; he held a degree as doctor of medicine from the American Academy of Medicine and Surgery, Washington, but did not practise; he was also a member of the British Homœopathic Association. The coroner, in summing up to the jury, disposed somewhat summarily of Mr. Mellor's titles and qualifications. "He calls himself a doctor of osteopathy but none of the institutions to which he referred are known in the academic world as genuine places where degrees are properly given; in other words he is simply a quack." It is evident, however, that the descriptions which Mr. Mellor had adopted were found impressive by members of the public. A sister of the deceased said that Mr. Mellor had been recommended by neighbours who thought he was a qualified doctor. The preamble to the Medical Act declares the expediency of the public being able to distinguish between the qualified and the unqualified practitioner. Mr. Mellor's plate obscured the distinction.

A Bogus Major of the R.A.M.C.

The police disclosed a curious career of imposture when Richard Gerald Willoughby pleaded guilty at Andover last week to summonses charging him with having unlawfully worn a major's uniform and military decorations at South Tidworth on August 3rd. Willoughby attended a cricket match at the R.A.M.C. ground, driving up in a large car. He was dressed as a major of the R.A.M.C. and wore field boots, a sword, the Military Cross, and other war medals. After watching the cricket he asked to be directed to the officers' mess, where, while accepting refreshment, he told an officer that he had come down from Millbank in connexion with an outbreak of diphtheria. He also said that there was a lot of tonsillitis about. He was afterwards entertained at dinner at the O.T.C. camp officers' mess; here he took too much to drink and was sent back to the military hospital. Doubts having arisen about his identity, he was taken to the police station where he said he was a doctor and a retired major, but could not now call himself a doctor as his name had been struck off the Register. Research by the police failed to show that Willoughby had ever held a commission in the R.A.M.C. The records showed that he had enlisted in the Duke of Cornwall's Light Infantry in September, 1914, as Percy Seymour Kelly, changing his name to Willoughby by deed poll on obtaining a commission in the Royal Fusiliers a month later. He resigned next year, re-enlisted as Robert Kelly and soon obtained a temporary commission as Eric Patrick Cosmo Gordon O'Kelly, but was removed from the Army a few months later. Enlisting again in the Royal Dublin Fusiliers, he deserted in November, 1915. He served once more as Percy Seymour Kelly from July to October, 1918, when he was discharged as physically unfit.

He had posed in London hotels as an officer in the Canadian Rifles. He had travelled round the country as a clergyman, visiting real clergymen, and on one occasion actually preaching a sermon. He served six months' imprisonment in America for impersonating a British officer, and had been imprisoned in Canada for posing as a doctor. He had obtained a situation as a chartered accountant at £1000 a year. He had described himself as Dr.

Robert Beatey Martin in Panama, and had obtained an appointment in that name as ship's surgeon in a British liner. He was landed at Singapore with malaria and, as Dr. Martin, escorted to England a judge who was ill. In 1932 he was sentenced at the Old Bailey to two years' imprisonment for false pretences and indecent assault. It was a remarkable history of fraud, and the Andover magistrates awarded him three months' imprisonment and £5 fine for his escapade at South Tidworth last month.

Puerperal Melancholia and Criminal Responsibility

Newspaper paragraphs last week described proposals for reforming the law of infanticide. Women who kill their babies while suffering from melancholia following childbirth should, it was suggested, be tried by a committee of alienists and psychiatrists instead of by an ordinary criminal jury. The proposals envisage the mother's mental state as partly an economic and political problem. It is hinted that the increase in infanticide may be due to unemployment, the mother being naturally worried at the extra addition to the family when the father is out of work.

Opposition may be expected from the judges, the legal profession, and the Home Office. It will be pointed out that two post-war statutes have operated, and were intended to operate, against mothers being found guilty of murdering their new-born children. The Infanticide Act of 1922 and the Infant Life (Preservation) Act of 1929 enable the most lenient view to be taken. The reformers seem scarcely to have given Parliament credit for the change in the law whereby the disturbed mental state of a mother within a short period after childbirth is now taken specially into account. Those concerned with the administration of justice are jealous of handing over the duties of courts to lay tribunals: they are sure to demand that facts shall continue to be found by magistrates and juries under a system which does not preclude the assistance of expert witnesses. Everyone will be sympathetic towards the anxieties of the mother at childbirth, but there may be some difference of opinion about the alleged increase in infanticide. The latest criminal statistics (those for 1933) suggest that the number of persons annually tried for infanticide under the 1922 Act is falling rather than rising. There was one case under the 1929 Act in 1931; there were no cases in 1932 or 1933. The coroners' statistics for 1933 show that 336 inquests were held on the bodies of newly born children. These were cases where inquests were adjourned under Section 20 of the Coroners (Amendment) Act, 1926, and not resumed, prosecutions being conducted in the ordinary criminal courts. Out of the 336 cases there were 13 verdicts of wilful murder, 2 of manslaughter, and 3 of infanticide. There is nothing to show the relation of these figures either to puerperal melancholia or to unemployment. It is a point with which the official editor of the criminal statistics might deal in next year's volume.

Inquest on Prehistoric Man

The *Times* of Sept. 5th recorded the holding of an inquest in Ireland upon human remains found at Mullaghneish mountain, near Londonderry, and estimated to be over 3000 years old. The evidence indicated that the remains were those of an Irish chieftain of the Bronze Age. They consisted of a portion of a rib, a tooth, and skull bone; they had been roughly cremated and were found in a bowl-shaped urn buried in a vault-like structure of stone in a bog; a substance of the nature of clay within the urn was apparently food to sustain the departed spirit on its journey. The coroner had taken the view that there was a question of ownership. The urn and remains had been removed to the Belfast Museum and he had served a warrant on the curator for their return; he thought the police should have the custody till the ownership was established. An English coroner would probably have left the question of ownership to another court; this was not treasure trove. The coroner's concern is with a dead body, and there are ancient legal difficulties about property in a corpse. The discovery of these ancient remains recalls the fact that there has occasionally been a pious practice of reinterring Stone Age, Bronze Age, or Iron Age skeletons in churchyards and cemeteries. Where piety has thought it necessary to "give Christian burial" to pre-Christian relics, it has been a necessity that must have made strange bed-fellows. It seems almost as incongruous to assert a coroner's jurisdiction over the prehistoric dust upon the shelves of a museum.

BRITISH ASSOCIATION
FOR THE ADVANCEMENT OF SCIENCE

Chemotherapy of Malaria

OPENING the discussion by the chemistry section of the Association on the chemotherapy of malaria, Colonel S. P. JAMES, F.R.S., referred to the distressing effects of the malaria epidemic and famine in Ceylon. The area affected was not as large as Yorkshire, but the cost of relief measures was about £350,000, and during the six months from November to April 14½ tons of quinine, costing £50,700, was used. About £20,000 was also spent on Atebrin. The epidemic had reminded the world once again that no royal road or short cut to the prevention of malaria had yet been found; during recent years similar reminders had come from British India, Malaya, East and South Africa, Nigeria, the Sudan, Mauritius, Trinidad, Barbados, and other British territories overseas. In view of these and other examples it had to be admitted that, despite some remarkable discoveries, existing knowledge on the prevention of malaria was not sufficient. Direct war on the malaria-carrying mosquito was too difficult and too costly for general use, and quinine had failed to maintain its old reputation as the sovereign remedy which meets all needs. More knowledge was needed in many different directions, one of them being the much neglected subject of chemotherapy. Quinine satisfied the practising physician because it promptly stopped most clinical malarial attacks; but it had the grave defects of not preventing infection of either the human host or the mosquito and of not preventing relapses. To discover and prepare drugs which would be effective where quinine failed was the chief aim and object of antimalarial chemotherapy. In Germany two synthetic antimalarials, Plasmoquine and Atebrin, which to a considerable extent fulfilled that requirement, had already been discovered, and now it was to be hoped that England would make adequate arrangements to pursue the subject in the same intensive way and with the same objects in view. Up to the present, said Colonel James, the chemical industries of this country had not concerned themselves with the matter, and the Government grants which had been allotted during the last few years to assist antimalarial chemotherapeutic research had

amounted to less than a two-hundredth part of the Empire's annual bill for quinine.

Colonel James then elaborated, with examples, the defects of quinine and the directions in which quinine therapy could be supplemented by atebrin and plasmoquine. It was clear, he said, that the discoveries made by Prof. W. Schulemann and his colleagues at Elberfeld had placed in our hands new antimalarial weapons of great power and precision, but there was still ample scope for further research in this and other countries.

Prof. SCHULEMANN then addressed the section on methods of chemotherapeutic research as exemplified by the antimalarial drugs. The successful production of these drugs at Elberfeld had, he remarked, been largely the result of the invention by biologists of new methods of testing the antimalarial properties of synthesised substances. There had been a growth of sympathetic understanding between chemist and biologist with the proper blend of intuition and organisation, and this had spelled progress which could never have been reached by trial and error or purely empirical methods. Plasmoquine, he said, was the thirty-fifth in a certain series to be tried out, and since 1924 only one other effective antimalarial substance had been found. While the operation of these antimalarial weapons was still obscure he surmised that the explanation might be found in the chemistry of surfaces; it had been found that mice could be killed if given drugs on an empty stomach, when they suffered no ill-effects from the same drugs given after a meal.

Prof. ROBERT ROBINSON, F.R.S., followed with an outline of the methods employed for the synthesis of potential antimalarials by himself and his colleagues, and discussed some of the results from the point of view of the relation between constitution and antimalarial action. He also directed attention to the pressing need for coöperation between chemists and biologists in a national institute for research in chemotherapy.

Dr. P. TATE (for Prof. D. KEILIN, F.R.S.) and Dr. M. VINCENT then submitted a joint communication on the chemotherapy of bird malaria and its importance in relation to the therapeutics of human malaria. They pointed out that bird malaria was a valuable means of testing the antimalarial action of new synthetic compounds, since many of these act in a similar way in human and in bird malaria. Routine tests on birds are made on asexual stages of the parasite transmitted by direct blood inoculation, but by utilising mosquito infections it is possible to determine the action of a compound on gametocytes and on sporozoites. The results of work on bird malaria are not always applicable to human malaria, but so far every synthetic compound of value in human malaria had been discovered by means of preliminary tests on bird malaria.

Dr. T. A. HENRY spoke on antimalarial drugs of natural origin. He said that from natural drugs having a local reputation as remedies for malaria—e.g., the alstonias of Australia, India, West Africa, and the Pacific Islands—a group of alkaloids had been isolated which might be antipyretic but were devoid of antimalarial activity. In order to determine the relative activities of the various cinchona alkaloids, the eight principal alkaloids had been prepared in a pure state and from tests in bird malaria had been arranged in the following descending order of activity: (1) hydroquinine, (2) quinine, (3) hydroquinidine, (4) cinchonidine and quinidine, (5) cinchonine, hydrocinchonine, and hydrocinchonidine. In general it could be stated that any change which diminishes the basic character of such an alkaloid as quinine reduces its antimalarial activity, though it may result in the development of pharmacological activity of another kind.

Sir RICKARD CHRISTOPHERS, F.R.S., then read a paper on chemotherapeutic effect as a combination through a basic side chain. He said that a usual conception of chemotherapeutic effect was molecular fit. The chemical nature of such fit was often not very clear, but the necessity of a basic side chain for linkage to protein was sometimes referred to. All antimalarial drugs natural and synthetic had such side chains. With a view to studying such combination, observations had been made upon absorption by red cells of some simple acids and bases, using critical hæmolysis of a given quantity of red cell substance and electrometric determination of the pH as guides to the reaction. It was found that lysis of the cell was brought about through formation of a critical amount of "protein salt," which amount was the same for all acids. With this is associated a fraction due to "hydrolysis" of the salt, which is greater the weaker the acid. This necessitates a larger dose in the case of some acids than others. This "hæmolytic dose" can be calculated with considerable approach to experimental findings. "Hæmolysis" is associated with a critical relation of iso-electric to ionised protein and a characteristic pH. Other critical events—e.g., lethality, if caused by ionisation—can be studied in a similar way.

Prof. WARRINGTON YORKE spoke strongly of the neglect in this country of research in chemotherapy.

AN AMBULANCE SERVICE FOR ETHIOPIA

BY JOHN M. MELLY, B.M. Oxon., F.R.C.S. Edin.

BEFORE describing the ambulance service which is being organised in this country to attend to the sick and wounded behind the lines of the Ethiopian army in the event of war with Italy, something must be said about the present state of medicine in Ethiopia and her existing medical resources.

THE MEDICAL RESOURCES OF ETHIOPIA

Whereas the Government has in recent years instituted a number of schools in various parts of the country where a remarkably efficient and high standard of education is maintained, no attempt has as yet been made to train native medical men. I was, however, in Addis Ababa, actually discussing with the Emperor a scheme for the foundation of a large modern hospital and medical school, when the present crisis arose. Architects' plans of a 300 bed hospital, incorporating the latest ideas in hospital construction and equipment, had been drawn up, and a complete schedule of medical education had been worked out. It had been decided that the site of the hospital, and of a medical school to accommodate 50 students, was to be at Harrar, the second largest town in Ethiopia. This scheme, of course, has had to be postponed, and in the meanwhile the inhabitants of Ethiopia, which is nearly as big as France and Spain put together, are served only by their native doctors and the European medical missionaries in the country.

The native doctors have undergone no training whatsoever in the European sense of the word. The secrets of their remedies are jealously guarded, and handed down from father to son. There is no doubt that they are in possession of powerful drugs and medicinal applications derived from local plants, but these are constantly misapplied and often do

more harm than good. One extract, for example, the identity of which neither I nor any other European has yet been able to discover, apparently exerts a violent but curiously selective action upon the tissues. It appears to eat away rapidly and to a considerable depth the tissues to which it is applied, leaving a clean, granulating surface. But the remarkable thing is that this extract is said to have no action on the vessels and nerves, these remaining completely untouched. A native recently came to a mission hospital with a massive sarcoma of the neck and operative treatment was advised. He preferred to return to his native doctor who applied this extract to the whole of the affected side of his neck. He was seen at the hospital a few weeks later, and the entire tumour had apparently been eaten away, leaving a deep granulating wound in which the vessels and nerves stood out as though cleaned by careful dissection. Reports of a leaf possessing these same selective properties have come, too, from other sources. I understand that some years ago, while Sir Auckland Geddes was travelling in Uganda, close to the Ethiopian border, a similar story reached him, but that he was frankly incredulous.

In Addis Ababa there are four moderately well-equipped missionary hospitals, the largest containing one hundred beds; and there are several missionary clinics scattered through the outlying parts of the country. In Addis Ababa also the Emperor has built and supports, out of his own private purse, a small hospital equipped with a modern operating theatre and X ray plant. It is run by a capable Swedish surgeon, and two Swedish sisters, who have trained a number of very efficient native nurses. Altogether there are in the country at the most about 500 hospital beds available for the ten millions of population. Practically all of these are worked by various missionary societies.

COMMON DISEASES

The disease which probably takes the largest toll of life is typhus fever. Malaria is common in the low country, where the inhabitants have developed a considerable immunity, but Addis Ababa is situated at a height of 8000 ft. above sea-level, and consequently it and the surrounding plateau are malaria free. Tape-worm is practically universal amongst the adult population owing to their taste for eating raw meat. They deal with the situation by taking an exceedingly powerful purge, derived from local herbs, regularly once a month. Relapsing fever is common, and dysentery is very frequent, especially among the European inhabitants, unless the strictest precautions are observed. Venereal disease, both syphilis and gonorrhœa, is rife throughout the whole land, and it is said that 90 per cent. of the adult population are affected. The organisms in both cases appear to be greatly attenuated, and the tertiary forms of syphilis are rarely seen. Infant mortality under one year of age in Addis Ababa—the only place where any attempt has been made to estimate it—is reputed to be over 50 per cent. Apart from these conditions, however, the cases seen at a hospital in the capital are very similar to those seen daily in any out-patient department in London.

The native doctors—perhaps mercifully—do not practise any form of surgery; and the Ethiopian army is wholly without a medical service. In the last few weeks the skeleton of an Ethiopian Red Cross Society has been formed. The personnel, presumably, consists of one or two missionary doctors, who can ill be spared from their already understaffed hospitals, and the dozen or so Ethiopian girls who have been trained as nurses. The fighting would be, in the early stages at least, many weeks' journey from Addis Ababa, and if the Ethiopian Red Cross Society should send its personnel to attend to the wounded on the field it would of necessity leave the hospitals practically without staff. It is probably intended, however, that the doctors should remain at their hospitals and there look after any wounded who might ultimately find their way back to Addis Ababa. Meanwhile the plight of the wounded on the field of battle would beggar description. The whole country is overrun with hyenas and jackals, apart from the larger wild beasts, and there is no doubt that those wounded who survived till night falls would become a prey to these animals.

REASONS FOR THE ORGANISATION OF AN AMBULANCE SERVICE

It is for this reason—because Ethiopia has virtually no means of looking after her casualties—that an ambulance service for Ethiopia is in the process of being formed.[1] Some two months ago a number of people, most of whom have had personal knowledge of the country and can consequently visualise the more vividly the appalling prospects, formed themselves into a committee to organise medical assistance for Ethiopia in case of war. The object of the service is purely humanitarian and without political bias. The organisation will work in close coöperation with the Ethiopian Red Cross Society, and to this end Dr. T. A. Lambie, who has worked in Ethiopia for nearly thirty years and who is on the committee both of this organisation and of the Ethiopian Red Cross Society, is already on his way to Addis Ababa.

The International Red Cross Committee in Geneva has been frequently consulted and has been most helpful with advice and encouragement. They have expressed a wish to keep in close contact with the committee in London, and this is being arranged. If war breaks out and the British Red Cross Society should decide to take action, it is proposed that the ambulance service now being formed should be incorporated with them in whatever way they may think best, and its personnel and matériel and any unexpended funds would be placed at their disposal. The British Red Cross Society have stated that any steps which they may ultimately take to help the Ethiopian Red Cross Society in succouring the sick and the wounded will be taken in conjunction with the committee of this organisation. Further, the Ethiopian Minister in London has given his assurance of full authorisation by the Ethiopian government under Articles 10 and 11 of the Geneva Convention.

In the meanwhile a great deal of preliminary work and organisation has been done. Subcommittees dealing with personnel, medical equipment, commissariat, and the exceedingly difficult problem of transport, have been hard at work for some weeks. Volunteers are being interviewed daily and all preparations are being made in case of war.

PLANS

It is intended to disembark at Berbera in British Somaliland and proceed by lorry via Hargeisa and Jigjiga to Harrar where the first field hospital will be established. Casualty clearing stations will be pushed out south-eastwards from there. The line of retreat will probably be due west from Harrar in the direction of Addis Ababa, and the next situation for the field hospital is expected to be Asba Tafari in Chercher Province. An advance liaison officer under orders of the transport committee is proceeding to Berbera immediately to make preliminary arrangements there and at Harrar and along the road between the two. Since it is impossible to take any transport into Ethiopia from the Sudan till early next year owing to the condition of the roads after the rains, the only remaining route of entry, when the advancing Italians cut the Berbera-Harrar line of communication, is from Kenya via Moyale to Addis Ababa. The chief transport officer has already flown to Nairobi to open up this route and to form a committee there to deal with supplies and transport from that end.

A few more medical men are still required, but if they and sufficient funds are forthcoming in the meanwhile, it is hoped that the expedition may sail before the end of this month.

[1] Details are given in our advertisement columns, p. 45.

CORRESPONDENCE

THE DOCTOR AS ADMINISTRATOR

To the Editor of THE LANCET

SIR,—On its opening page the *Hospital* for September comments on the leading article entitled The Doctor as Administrator in *The Lancet* of August 10th and in very definite terms supports the appointment of lay administrators. Speaking of the medical staff of hospitals the *Hospital* remarks: "As such, their influence is very great, and no lay committee, or lay administrator, is in a position to say them nay in matters affecting medical practice." One of the chief objections to the principle of lay administration is admitted in this comment. It is surely not in the public interest that a body of experts should have all the power with regard to the purchasing of new and expensive instruments or apparatus which, often, the hospital can ill afford, and I quite agree that a lay administrator cannot safely disregard a request from a member of the medical staff. A medical superintendent, on the contrary, can, with his professional knowledge, discuss the request intelligently with one eye on the bank balance and the other on the medical and surgical requirements of a progressive hospital.

There has been much discussion of late on the question of lay versus professional administrators for hospitals. Will anyone deny that a medical man, with average business instinct and acumen, has a distinct advantage over the lay person by virtue of his having, in addition, professional training?

I am, Sir, yours faithfully,

DAVID G. MORGAN.

Llandough Hospital, Cardiff, Sept. 7th.

THE DOSAGE OF ALKALI

To the Editor of THE LANCET

SIR,—I was glad to read the letter of Dr. Geoffrey Evans in your last issue,* for, in addition to the value of the suggestions which he makes, it serves to call attention to Dr. Oakley's admirable article. Dr. Oakley showed that alkalosis is far from rare in intensive alkali treatment, and Dr. Evans replies, in effect, that it is unknown if a dose of alkali is used which is adequate without being excessive.

When Dr. Oakley's article appeared I wrote to him pointing out that in all of the cases in his article (four out of seven) in which the hæmoglobin percentage was mentioned a severe degree of anæmia (ranging from 30 to 57 per cent. hæmoglobin) was present, and that recent experience of my own had convinced me that in the development of alkalosis under alkali treatment the anæmia was the significant ætiological factor. I instanced a case in which a patient suffering from pyloric ulcer and hæmatemesis developed alkalosis under treatment. I did not at that time recognise the symptoms as such, but they were, in fact, quite characteristic. My attention was concentrated on the patient's anæmia; her hæmoglobin was only 32 per cent., but as, under appropriate treatment, the percentage of hæmoglobin increased to over 70 per cent. the symptoms of alkalosis cleared up entirely, and this in spite of the fact that the dose of alkali was maintained at exactly the same level.

Dr. Oakley's reply was interesting, for he explained that there was a sound biochemical reason for this clinical observation, since the hæmoglobin itself plays an important part in the maintenance of the acid-base equilibrium of the blood. Moreover, he had not referred to these facts in his article because he was himself elucidating the matter by giving alkalis to anæmic and non-anæmic patients with peptic ulcer, and observing the variations in the alkali reserve in both groups produced by the same doses of alkali.

While we await the result of this research it would appear wiser to adhere to some such prescription of alkali as Dr. Evans suggests, especially in treating patients who have had serious bleeding from peptic ulcers and are therefore anæmic—a clinical combination which is sufficiently common.

I am, Sir, yours faithfully,

Derby, Sept. 9th. DOUGLAS HUBBLE.

* Dr. Evans wishes to correct 47 grammes to *37* in line 20 of his letter.—ED. L.

PROCTALGIA FUGAX

To the Editor of THE LANCET

SIR,—The interesting paper on a unique form of rectal pain which Dr. Hess Thaysen contributed to THE LANCET of August 3rd emboldens me to offer here the abbreviated history of one instance of the malady in which both cause and cure have been established.

Dr. X. Y. had long been intimately acquainted with this entity, but being in matters of personal indisposition confirmedly ostrichous (terms, Sir, no more inadmissible than Dr. Thaysen's "proctalgia fugax"), he waited 16 or 17 years before requesting a surgical colleague to examine him. This gentleman finding nothing of surgical interest suggested examination by a urologist, which latter in turn fell at once to massaging the prostate. Now the patient is not a fellow of famous faith in placebos, however well-intentioned their administration, so after two of these séances he thanked his professional friend most kindly and took refuge in lonely pondering. For many years I had been encountering him early each morning, but despite these frequent meetings our relationship had never progressed beyond the point of rather self-conscious and hurried mutterings when we met. I must confess that I felt he always thought me a little dull in most things, and in matters medical by no means the purist he would have liked. But suddenly one morning he quite overcame his diffidence or dislike and asked my professional opinion regarding this complaint of his. Hearing him recount the symptoms it seemed to me that one might connect these seizures with those occurring in certain types of "pseudo" angina pectoris. When I expressed what was in my mind his conduct amazed me, for he slapped me intimately on the thigh and exclaimed, "Why that's it, to be sure! Nothing could be more simple. You merely quit smoking and—well, there you are!" At any rate, he did stop smoking and within the week was cured.

This occurred about fourteen months ago, and I continue to see him regularly. Twice he has taken up with the weed again, and in each instance the old tormenting trouble has promptly returned. At the present writing he has not smoked since the first day of July; he is completely symptomless and vows to me that this time his resolution is of the staunchest. But, alas, I am beginning to know the poor chap so well!—I am, Sir, yours faithfully,

HARRY BECKMAN.

Marquette University, School of Medicine, Milwaukee, Wis., U.S.A., August 26th.

To the Editor of THE LANCET

SIR,—A number of correspondents have written to you about this newly described condition. A patient of mine, male, aged 24, has been greatly troubled with it off and on for four or five years; this case is a little different from the others described in your columns because he may have an agonising rectal spasm or painful penile erection, or both. He came to me recently with both, and I gave him

marked relief by blowing 20 puffs into his rectum with a Higginson syringe. The condition was not cured, but the residual pain disappeared at once when I gave him 3 minims of amyl nitrite. I feel justified in dashing into print with only one case to the credit of this drug, because its effect was so dramatic, and because it is so easily applied. A few seconds with a capsule and a handkerchief at the side of the tennis court, or in the cloak room at a dance, and all is well, and he can rejoin his party.

I am, Sir, yours faithfully,

East Grinstead, Sept. 3rd. W. H. MARSHALL.

TREATMENT OF ECLAMPTIC TOXÆMIA

To the Editor of THE LANCET

SIR,—I write to let you know of good results we have been getting in the treatment of eclampsia and pre-eclampsia at the Royal Lying-in Clinic and Midwifery School at Szolnok.

It is now ten years since Lazard introduced the treatment of pregnancy toxæmia by intravenous injection of magnesium sulphate and glucose. The effect of this treatment is primarily sedative; it controls convulsions far more surely than the Stroganoff régime—indeed, I do not remember a single case in which it has failed to stop them. It also lowers the blood pressure and has a diuretic influence. This threefold action has been responsible for excellent results, but our experience of the past two to three years suggests that these can be further improved by giving a diet rich in carbohydrates and vitamin C. This is less trying to the patients than is Volhard's "starvation diet," and while the glucose may afford valuable support to the liver in its work of detoxication, the vitamin C may counteract the factors which cause the internal hæmorrhages often found post mortem.

In pre-eclampsia the patient received each day 400 grammes of milk, with lemonade made from six lemons and 200 g. of sugar (making 1·5 litres divided into six portions). No other food was given. The results, as I have said, seemed to be improved, and in view of F. G. Dietel's demonstration (Arch. f. Gynäk., 1935, clix., 94) of serious vitamin-C deficiency in eclampsia I decided to add this vitamin in the form of ascorbic acid to the injections of magnesium sulphate and glucose. Prof. Szent-Györgyi, who first isolated this substance, puts the average therapeutic dose at 0·05 g. in 24 hours, but we know, from Vogt's successful use of it in the treatment of excessive uterine hæmorrhage in girls, that doses of 0·1 to 0·12 g. can be given without damage and with good effect. In consultation with the firm of Gedeon Richter Ltd., I decided to include 0·0125 g. of Proscorbine Richter in each ampoule of magnesium sulphate and glucose. Thus in a mild case of eclampsia if four injections sufficed to dispel all danger the patient would receive 0·05 g. ascorbic acid, while in more severe cases, requiring eight doses in the 24 hours, she would get not more than 0·10 g., and that in *dosi refracta*. The 20 c.cm. ampoules supplied to me by the firm for purposes of investigation contain 20 per cent. of pure glucose and 10 per cent. of magnesium sulphate, with 0·0125 g. of proscorbine.

The rapidity with which the combined remedy acts is really remarkable. When it was used in our usually very severe cases of eclampsia (with blood pressures of 180, 170, and 150 mm. Hg, widespread œdema, and in one case commencing œdema of lungs) albuminuria ceased, generally within three to four days, the œdema went down quickly, and the blood pressure was in all of them normal four or five days after confinement.

Since the adoption of this combined remedy we have treated 14 cases of pre-eclampsia. None of them had blood pressure under 130 and there were two with a blood pressure of 200/220. With the exception of one case (B.P. 200) in which the pressure could only be brought down to 180 we succeeded without the induction of labour; in that case labour was induced and the treatment continued, with the result that the outbreak of convulsions was avoided and the woman left the hospital quite well. We used the combined remedy in 11 of 12 cases of developed eclampsia; the other case was admitted in a hopeless condition with severe œdema of the lungs, and before anything could be done a severe convulsion brought the end. Of the 11 cases 9 were saved and 2 died of their eclampsia, though the convulsions were controlled.

If we consider the extreme severity of eclampsia in Hungary, and especially in Eastern Hungary, and the fact that nearly all the cases were transferred to us from the country (being chiefly the worst cases) the new treatment does seem to improve the outlook for the future.—I am, Sir, yours faithfully,

Szolnok, Hungary, Sept. 6th. EUGÈNE DE KONRÁD.

WHOOPING-COUGH SKIN-TEST

To the Editor of THE LANCET

SIR,—Since the publication in your issue of August 17th of the article by Dr. Paterson, Dr. Bailey, and myself it has been pointed out to me that we do not specifically state the dose of pertussis vaccine normally used for the skin-test, the strength of the vaccine employed in the test, or the source from which the vaccine is obtainable. We should be glad therefore if you would clear up these points by publishing the following:

1. The intradermal dose for the skin-test is normally 0·1 c.cm., but it has been found in some cases that a smaller dose such as 0·05 c.cm. may give a positive result more easily read than in the case of the larger dose.

2. The vaccine for the skin-test is used at full strength (10,000 million bacilli per c.cm.) as sent out by the manufacturers.

3. The vaccine (Sauer) is prepared by Eli Lilly and Co., Ltd., and is obtainable from any pharmacy in this country.—I am, Sir, yours faithfully,

R. G. WALLER.

John Burford Carlill Pathological Laboratories, Westminster Hospital, S.W., Sept. 6th.

ADHESIVE STRAPPING AND THE PATCH-TEST

To the Editor of THE LANCET

SIR,—I am somewhat perturbed by your annotation of August 17th on elastic adhesive strapping, particularly in the treatment of gravitational leg ulcers. I am perturbed because, judging from six years' experience in my varicose vein clinic, the dermatitis I encountered has been negligible. In this clinic all the varicose ulcers are treated with Elastoplast—more or less according to the Dickson Wright technique: and all heal rapidly with monotonous regularity. Occasionally (say 3 per cent. of cases) a little dermatitis remains on the removal of the bandage. In very mild cases these are dabbed with calamine lotion and a further elastoplast is immediately applied. In a few cases a calamine dressing is put on for 24–48 hours and then a new elastoplast bandage is applied. I have only had five cases of serious allergic dermatitis among over 4000 in

which elastoplast has been applied. In three of these the eczema was confined to the legs; two had generalised allergic eczema. In every case the eczema had cleared up in six weeks.

No treatment is free from snags. The elastoplast treatment for varicose ulcer is so sure and swift, so immeasurably better than Unna's paste bandages, that the small risk of dermatitis is, in my view, negligible. Your annotation may suggest to some the possibility of abandoning elastoplast and the return to a more primitive and far less successful line of treatment. I write to ask these wavering venologists not to retrace their steps from the heights which elastic adhesive bandages have enabled them to conquer.—I am, Sir, yours faithfully,

Liverpool, Sept. 2nd. STUART MCAUSLAND.

RAW EGGS FOR INSOMNIA AND NEURASTHENIA

To the Editor of THE LANCET

SIR,—I would like to draw attention to the value of raw hen's eggs in conditions of nervous debility and irritability and especially as a remedy for insomnia. I have found them remarkably helpful in cases of the kind termed "neurasthenia" in which, without discoverable cause, there is undue fatigue, emotional imbalance, and often symptoms referred to the heart, stomach, or bowel. On an egg régime a number of patients who had previously exhausted the resources of medical treatment have reacted rapidly and recovered within a month from states bordering on invalidism. Most of those I have treated in this way during the past five years have been males between the ages of 18 and 30, and the following cases may be briefly described to illustrate the results.

1. A Burmese, aged 24, a vegetarian, complained of intractable insomnia for the previous four years. He was fairly well built and no organic trouble could be detected. His symptoms conformed to the classical picture of neurasthenia and need not be further detailed, except to say that his chief disabilities were inability to concentrate and insomnia and that occasionally he suffered from writer's cramp. Insomnia was the most distressing feature, and he was forced to have recourse to hypnotics, including bromides, chloral hydrate, paraldehyde, and morphia. These induced a non-refreshing sleep so long as they were used, but sleeplessness returned when they were discontinued. When I met the patient he was a mental and physical wreck, on the verge of suicide. He had tried almost every remedy that he could lay his hands upon, not excluding psychotherapy. In this predicament I could suggest nothing special, but just advised him to take some hen's eggs; and since his digestion was bad I recommended him to take them raw. He was to begin with eight eggs the first day; six on the second; four on the third; and two on each successive day. The eggs were to be taken in the morning before or after breakfast. The result was dramatic. He said that he had good sleep for the first time for four years and his mental concentration had greatly improved.

As this seemed interesting, it was decided to experiment on him with the following results. Insomnia returned if the eggs were discontinued. The quality and quantity of sleep was proportional to the number of eggs taken. Two eggs produced the same amount of sleep as 40 grains of bromide. The eggs, as mentioned, were taken in the morning. He felt sleepy during the day, but actually fell asleep during the night, the sleep being excessive and dreamless during the first few days as if compensating for the previous insomnia. The number of eggs had to be increased if there was greater mental or physical exertion. The eggs seemed to act only if they were taken raw. The effect was not due in any way to the caloric value of their protein, since equivalent or greater quantity of meat or other protein had no effect whatsoever.

After about four months the patient could sleep without taking eggs daily—two eggs two or three times a week being sufficient—but the sleep was always better on the day he took eggs. As he gradually recovered it was found that the hypnotic effect of eggs was manifest only if he had had insomnia the previous night. The egg treatment ended after two years, the patient having made a complete recovery. He gets insomnia only if he takes severe exercise or indulges in excessive mental exertion. A couple of eggs restores his normal sleep.

2. A Chinese, aged 30, complained of palpitation and insomnia of about three years' duration. His main trouble was that he did not fall asleep until midnight or 1 A.M. and was wide awake again by 3 or 4. No organic trouble could be detected. He was put on eggs and he improved rapidly.

3. An Englishman, aged 23, living in Cambridge, complained of intractable constipation coupled with insomnia. The trouble began when he was 18 years of age. He began to be sleepless, forgetful, and strange in manner for about a fortnight, after which he was admitted to a mental hospital, where he presented signs and symptoms of dementia præcox. He could not sleep without drugs; he was obstinately constipated and had to be relieved by enemas at first and aperients later. He was kept in hospital for about six months, and had a further month's rest before starting work. For two years he had to be relieved occasionally by salts. At the age of 21 he again had an acute relapse and was admitted to the mental hospital for dementia præcox as before. He was discharged after about three months, aperients still being required. His condition generally became aggravated each summer when he suffered from restlessness, insomnia, and fatigue, becoming unfit for much physical or mental exertion, as if on the verge of an acute relapse as before. I met him when he was 23. He was put on eggs and a few days later was able to do without aperients. He has recovered his general health and the insomnia has also disappeared. He has been taking eggs for the last nine months and has not once taken an aperient. This has been his first summer during which nothing untoward has happened; he has been capable of more physical and mental exertion than ever before, and is like any normal person. Till about eight months after he began to take eggs, the constipation usually returned if they were discontinued; but now he only takes them on alternate days or about twice a week.

4. Another Englishman, aged 32, complained of insomnia, the cause of which seemed excessive worry through business difficulties. He has been relieved by eggs. They induce diarrhœa in him, so that their use has to be stopped occasionally.

5. An Indian, aged 25, living in Burma, complained of obstinate constipation, lack of concentration, and insomnia of a year's duration. No organic cause could be detected. He was put on eggs and reported recovery after three months.

6. An Englishman, aged 20, and a Burmese student, aged 19, complained of great physical and mental exhaustion after excessive sexual indulgence. Both made a complete recovery with eggs.

7. An Englishman, aged 43, living in Cambridge, had suffered from insomnia for seven months. He also had constipation, which had to be relieved by a daily dose of salts. (It will be noticed that constipation is regularly associated with insomnia.) No cause could be assigned to the insomnia except business worry. Previously he had slept for seven or eight hours each night, but now his sleep had been reduced to two or three. If he went to sleep at 11 P.M. he was generally awake at 1 A.M.; if he went off at 1 A.M., he would be awake at 3. He had tried all sorts of remedies without avail. He was advised to take four eggs daily, with the result that he recovered his normal sleep on the third day of treatment and said he was perfectly fit for his work. His constipation has also disappeared.

In several cases a history of excessive sexual indulgence has been elicited. Mental and sexual activity seem to bear an inverse ratio one to another:

when the former increases the latter diminishes, and vice versa. A possible explanation is that the testes and nerve-cells alike require some substance which is liable to be deficient, and my own observations suggest that the deficiency is made good by administration of raw eggs. If this is true one would suppose that ingestion of large quantities of raw hen's eggs by a normal person might lead either to excessive testicular activity or increased mental activity. This is found to be so. In India eggs are generally considered to have an aphrodisiac effect, and in normal persons they increase the frequency of seminal emissions unless hard mental (or physical) activity makes countervailing demands. It is found that ingestion of eggs averts fatigue, and students preparing for examination, and athletes, report favourably on their use for this purpose. The effect seems to be more obvious—and sometimes dramatic—in exhausted people, especially those who give a history of excessive sexual intercourse.

In view of these findings I would strongly urge the wider use of raw eggs in clinical practice and also investigation into the possibility that they contain some substance with a specific effect, which could be extracted in concentrated form. To a certain extent at least this substance seems to be destroyed by heating. In treatment it is essential that the eggs be taken in the morning.—I am, Sir, yours faithfully,

Cambridge, August 29th. I. SINGH.

THE TREATMENT OF EPIGASTRIC HERNIA

To the Editor of THE LANCET

SIR,—For the past five years I have been successfully treating epigastric hernia without having recourse to the open operation. I inject the hernia instead with 2 c.cm. of a 5 per cent. solution of quinine urea hydrochloride. This obliterates the blood-vessel which is the invariable concomitant of an epigastric hernia, causes the pledget of fat to be ultimately absorbed from lack of nutrition, and leads to sclerosis with subsequent obliteration of the small hernial opening. It is strictly an office procedure and the number of treatments necessary to obtain a cure are few. If there is a subsequent recurrence one or two more injections usually suffice. This method does not necessitate any loss of time from work, which, in this day and age, means a good deal to the patient; in addition, the financial saving is, of course, considerable.

I was led to adopt this treatment by observing that a so-called epigastric hernia really consists of fat forced through the small opening in the transversalis fascia in the linea alba made by a perforating blood-vessel, together with the blood-vessel itself. There is never a distinct hernial sac, and if one is careful while operating to remain in the mid-line the abdominal cavity will never be opened. The reason why epigastric hernia is so seldom diagnosed is simple. In ordinary palpation of the abdomen it is the surgeon's aim to obtain complete relaxation of the abdominal wall. The exact opposite is necessary in order to demonstrate an epigastric hernia. With the patient lying supine, he is directed to lift the head and shoulders off the examining table so as to put a strain on the abdominal muscles. This will cause a slight divarication of the recti muscles. Now gently palpate with the tip of the examining finger the whole length of the linea alba from the ensiform cartilage to the umbilicus. If an epigastric hernia is present a small depression will be found containing a small soft mass which is fairly tender on even light pressure.

If the onset of epigastric hernia is acute there may be extreme pain and even some abdominal rigidity—the latter however being more apparent than real. I remember seeing a man who was about to be operated upon for a supposed perforated gastric ulcer. He had previously had two other abdominal operations—one for removal of a so-called chronic appendix. His onset of symptoms was sudden and extremely acute, with vomiting, pain, and apparent rigidity. There was however no rise of temperature or pulse-rate, no decrease of liver dullness, and no alteration of the leucocyte count. Careful examination showed a small epigastric depression extremely tender to even light pressure. I injected some novocain into the area and in five minutes he was free from distress. Needless to say, his abdomen was not opened. There is often associated with epigastric hernia a dragging pain described as if the "back were pulled forward into the stomach," which causes the patient to flex the spine so as to decrease the pull on the recti muscles. Such cases may be treated intermittently for months or even years for gastritis or indigestion without obtaining the slightest benefit. When the true condition is diagnosed and appropriate treatment instituted, the relief is immediate.

I am, Sir, yours faithfully,

H. F. W. WARDEN.

Detroit, Michigan, U.S.A., August 19th.

AUSTRALIA

(FROM OUR OWN CORRESPONDENT)

DEVELOPMENTS OF CANCER CONTROL IN AUSTRALIA DURING 1934

A REVIEW of the attempts at cancer control in Australia during 1934 was presented to the Sixth Australian Cancer Conference held at Canberra, from May 14th–17th, by Dr. M. J. Holmes, senior medical officer, Commonwealth Department of Health, and is now published in the August issue of the *Journal of the Cancer Research Committee*. At present the control of cancer in Australia is limited to organisations in each separate State; the formation of a federal body has been considered but has not been adopted. In New South Wales, during the year, the senate of the University of Sydney relinquished control of the Commonwealth radium, which was distributed to a number of hospitals. The university still continues to hold some radium which is used for research purposes and the production of radon. A committee for study and treatment of cancer has been formed in Sydney and new clinics have been established at Royal North Shore and the Prince Henry Hospitals. In Victoria a public meeting was called by the Premier to discuss the promotion of a State organisation for the control of cancer, and although it was decided to form this body and its objects were defined and a scheme drafted, no further progress has been made. The Melbourne and St. Vincent's Hospitals report expansion of their radiotherapeutic departments and the Austin Hospital, which provides the largest and best accommodation for cancer cases in Victoria, has increased its cancer accommodation from 83 to 130 beds. A clinic for the treatment of cancer of the cervix uteri and of the breast has been opened at the Prince Henry Hospital, Melbourne. In Tasmania two committees, one in the North and one in the South, are now functioning as units of the Tasmanian Anti-Cancer Campaign, the latter committee having

been formed during 1934. It is proposed to instal a deep ray therapy plant at the Launceston Hospital. In Western Australia, the principal development has been the establishment of a radon laboratory at the University of Western Australia. In other States no changes are reported. During the year the Commonwealth Radon Laboratory issued 23,210 millicuries of which all, except 1250 units issued for research purposes, was used for treatment, 92 per cent. being issued mounted in needles.

TREATMENT OF INFANTILE PARALYSIS

Many of the differences between those interested in the trial of the method of treating infantile paralysis devised by Sister Kenny have now been satisfactorily composed.[1] At present Sister Kenny is in personal charge of three centres, one at Townsville, one at Brisbane, and one about to be opened at the Royal North Shore Hospital, Sydney. It is believed that a clinic may be opened at the Children's Hospital, Frankston, Victoria, but no definite announcement to this effect has yet been made. The work done at the Sydney clinic is being watched by two committees, one appointed by the Commonwealth and one by the State Government. These committees are to examine cases before and after treatment and to report on the method and its value. In the *Australian Hospital* for June, 1935, there appeared a letter from Dr. James V. Guinane to the chairman of the Hospitals Commission, Sydney, which contained the first detailed account of the method to be published. Dr. Guinane, who has spent many months observing the method, considers that the régime introduced by Sister Kenny is a definite step forward in the treatment of infantile paralysis. He states that: (1) no splints, plaster, or other methods of immobilisation are used; (2) all the joints of the body are moved through their full range, at least once daily; (3) the patient is encouraged to perform movement under the guidance of and with the assistance of the attendant's hands when a movement cannot be performed unaided; as the performance of a movement gains in strength it is resisted so that the recovering muscle is subjected to gradually increasing load; (4) no exercises beyond those prescribed are allowed. The advantages of the absence of splintage are held to be avoidance of (1) stiffness in the joints or disuse atrophy of the muscles, (2) interference with the blood-supply to the parts, (3) any feeling of helplessness or hopelessness engendered in the patient by immobilisation of a limb. The use of active rather than passive movements gives the patient confidence and the movement itself increases the blood-supply. The conclusions reached by Dr. Guinane seem to be that the method is suitable only for cases of infantile paralysis and spastic paralysis and that, as might be expected, the best results are achieved in the earliest cases. Improvement is in his view quicker and greater than when the orthodox methods of treatment current in Australia are used even if cases are not seen very early, but the treatment is of no value in really advanced cases. These claims are much more modest than those originally made for this method. The aspect of the whole matter which continues to puzzle medical men is why it is shrouded in so much mystery and why even Dr. Guinane seems to think that the method must gain recognition before the details are made known. It is understood, however, that a book written by Sister Kenny is at present being printed in Brisbane, and it is to be hoped that it will provide a full account of her method.

[1] See THE LANCET, 1935, i., 1408.

PANEL AND CONTRACT PRACTICE

What is Manual Labour?

IT might have been thought that after 22 years there would have been little doubt as to what classes of persons were insurable and what classes were not. We learn, however, from the sixteenth annual report of the Ministry of Health that for the first time for many years a question was submitted for decision directly to the High Court under Section 89 (1) of the Act of 1924. The question referred was whether the employment of a professional footballer is to be regarded as employment by way of manual labour. It will be remembered that the income limit of £250 a year applies only to non-manual workers; for manual workers there is no income limit. It has long been held that professional footballers and cricketers were manually employed, this view being based on certain pronouncements of the Court of Appeal in a case arising out of the Workmen's Compensation Act, but certain observations that fell from a judge in the course of an appeal concerning the employment of an acrobat made it apparent that the question whether a professional footballer is, in fact, employed "by way of manual labour" was one upon which it was expedient to obtain the specific guidance of the High Court. The decision was that the employment was not "by way of manual labour" and that the player, therefore, since the rate of his remuneration exceeded £250 a year, was not required to be compulsorily insured.

Regional Medical Service

The paragraphs in the report on the regional medical scheme are of more than passing interest. The total number of references for advice as to incapacity for work in 1934 was 468,476, of which only 2304 were referred by insurance doctors, the remainder coming from approved societies. Of these references 181,220, or 39 per cent., related to men and 287,256, or 61 per cent., to women. The number of persons actually examined on incapacity references was 246,088. The number who were reported to have received a final certificate before the date fixed for examination was 134,678, and 86,628 others did not attend for examination. Of the persons examined 179,010 were reported as incapable and 67,078 as not incapable of work. Consultation references numbered 1361, 70 only of them being from insurance doctors. These figures speak for themselves. They tell us just what it is that keeps the regional medical staff busy all day and every day. And occasionally the onlooker will be constrained to ask: Is it inevitable? or Is it worth while?

Doctors and Chemists

In 1934 there were 15,500 doctors in insurance practice, and medicine and appliances were available as part of medical benefit at about 10,000 chemists' shops to approximately 14,973,000 insured persons entitled to medical benefit. The cost of medical benefit was £8,514,000, of which sum insurance

doctors received over £6,175,000 and £1,861,160 of the balance was paid to insurance chemists for the supply of drugs and appliances. The remainder was expended as to £204,000 to insurance doctors in rural areas on account of mileage; as to £194,000 to doctors for medicine and appliances supplied by them personally or for medicines dispensed by them in country districts where patients are out of reach of chemists; as to £64,200 on account of insured persons who exercised their option to claim medical benefit through approved institutions; something over £8000 was set aside to enable country doctors to attend courses of post-graduate study and to provide them with other desirable facilities such as telephones, motor-cars, branch surgeries, or reasonable vacations; while £7550 was paid on account of insured persons who were required or allowed to make their own arrangements for medical benefit. Of the sum of £8000 referred to above, £2354 was expended in grants which enabled 86 doctors to attend short courses of post-graduate study, but this facility is restricted to insurance doctors in sparsely populated rural districts.

There was a decrease of 2·3 per cent. in the number of insurance prescriptions dispensed in 1934 compared with the previous year, the numbers falling from 59,338,504 to 57,986,980, and the average number of prescriptions issued per insured person entitled to supplies decreased from 4·56 to 4·49. The decline in the number of prescriptions dispensed was less than might have been expected in a year of freedom from severe influenza, and the report states that the continuance of this high frequency is a matter of concern to the department. The total of the chemists' accounts fell from £1,985,885 to £1,941,874. The average ingredient cost per prescription rose from 3·643 pence to 3·677 pence, but the average total cost of drugs and prescribed appliances for insured persons entitled to obtain them from chemists fell from 2*s*. 11½*d*. to 2*s*. 11*d*.

Prescribing Excessive?

The number of cases in which it has been found necessary to withhold money from doctors on account of excessive prescribing continues to be low as compared with the number of cases in which prescribing has been reviewed or has been investigated under the more formal manner prescribed under the regulations. Regional medical officers paid 928 visits to insurance doctors in England where the doctors' prescribing appeared to call for explanation, and in only a small number of cases did this exchange of view fail to enable the Minister either to accept the explanation offered by the doctors, or to satisfy himself that relatively minor departures from a reasonable standard of prescribing would not recur. In ten cases the Minister found it sufficient to inform the doctors that, while it appeared to him that notwithstanding their explanation there was a prima-facie case for referring the matter to the panel committee, he would refrain from that course because he was satisfied of their intention not to give occasion for such reference to be considered in the future. In four cases the Minister felt it necessary, after considering the explanations given by the doctors, to refer to panel committees the question whether the doctors' prescribing had imposed charges on the available funds in excess of what was reasonably necessary. In all four cases the panel committees found that an excess cost had been so imposed during the quarterly periods which were the subject of investigation. The estimated amounts of excess cost ranged from £12 10*s*. to £30. None of these findings was made the subject of appeal. After considering the recommendation of the insurance committees made in the light of the findings of the panel committees, and giving the doctors concerned an opportunity of making oral or written representations, the Minister withheld money during the year from the remuneration of doctors in three cases, the sums withheld being £10, £7, and £3 respectively.

PUBLIC HEALTH

Another Case of Botulism

Dr. Edwin Smith, the Hammersmith coroner, held on Monday an adjourned inquest on the body of a commercial traveller, aged 55, and the jury returned a verdict of "Death by misadventure due to the toxic poisoning of botulism." The dead man's wife testified that on Wednesday, August 14th, she made for her husband a meat pie, of which a little was still left over on the following Sunday, the intervening period having been very hot. She thought, but was not sure, that he did eat some of the stale pie on the Sunday. After a period of three or four days, during the early part of which the patient vomited, and the bowels remained obstinately closed, he was admitted to Hammersmith Hospital. He was then conscious but in some distress, with complete ophthalmoplegia, marked weakness of the muscles of the tongue and throat, and extreme dryness of mucous membranes. Temperature and pulse were normal, and he could speak, although indistinctly. Botulinus antitoxin was given intravenously about three hours later. Death occurred seven hours after admission, apparently from combined failure of respiration and circulation. Dr. A. A. Miles, reader in bacteriology at the British Postgraduate Medical School, in his evidence said he had examined the gravy submitted to him. Cultures from it had yielded filtrates toxic to mice, the toxicity being neutralised by botulinus antitoxin. Search is still being made for the infecting organism. Sir Bernard Spilsbury said he thought that botulism was clearly established as the cause of death. Vegetables are, he remarked, likely to be contaminated if they have been insufficiently cooked and then left in very hot weather. The case is of particular interest as being the only one so far established in this country in which fatal botulism has resulted from food cooked in the home. How under these circumstances it came about that the organism which only develops its fatal toxin under anaerobic conditions was able to do so remains for further investigation.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 31ST, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1781; diphtheria, 913; enteric fever, 81; acute pneumonia (primary or influenzal), 384; puerperal fever, 34; puerperal pyrexia, 95; cerebro-spinal fever, 14; acute poliomyelitis, 34; acute polio-encephalitis, 2; encephalitis lethargica, 6; dysentery, 11; ophthalmia neonatorum, 72. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Sept. 6th was 2585, which included: Scarlet

fever, 761; diphtheria, 910; measles, 39; whooping-cough, 404; puerperal fever, 29 mothers (plus 12 babies); encephalitis lethargica, 270; poliomyelitis, 13. At St. Margaret's Hospital there were 25 babies (plus 12 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 3 (0) from measles, 3 (0) from scarlet fever, 21 (4) from whooping-cough, 27 (3) from diphtheria, 60 (13) from diarrhœa and enteritis under two years, and 12 (3) from influenza. The figures in parentheses are those for London itself.

Deaths from diarrhœa and enteritis were scattered over 30 great towns, the highest numbers being Liverpool 9, Southampton, Leeds, and Nottingham each 3, no other great town more than 2. The 3 fatal cases of measles were at Liverpool. Birmingham reported 4 deaths from whooping-cough; the remaining fatal cases were scattered singly over the country. No great town reported more than 2 deaths from diphtheria.

The number of stillbirths notified during the week was 290 (corresponding to a rate of 44 per 1000 total births), including 35 in London.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. T. Madill to *Orion* as Squadron M.O., and W. E. Heath to *Victory* for R.N.B.

Surg. Lt.-Comdrs. A. L. McDonnell, S. G. Weldon, and W. G. C. Fitzpatrick to rank of Surg. Comdrs.

Surg. Lt.-Comdrs. E. J. Mockler to *Pembroke* for R.N. Hosp., Chatham, and T. L. J. Barry to *Londonderry*.

Surg. Lt.-Comdrs. (D.) T. G. A'C. Emberson to *St. Vincent*, P. S. Turner to *Ganges*, and L. V. Donegan to *Pembroke* for R.N.B.

Surg. Lt. W. M. Greer promoted to Surg. Lt.-Comdr.

Surg. Lts. H. L. Cleave and C. N. H. Joynt to *Drake* for R.N.B., H. J. Bennett to *Pembroke* for R.N.B., and R. H. A. Turner to *Queen Elizabeth* and to *Resolution* (on transfer of flag).

ROYAL AUSTRALIAN NAVAL RESERVE

The King has approved of the award of the Volunteer Officers' Decoration to Surgeon Commander Percy Gerald Shelton, M.B., B.S.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdr. H. P. Widdup to *Pembroke* for R.N. Hosp., Chatham.

Surg. Lt.-Comdr. J. E. Purves's resignation accepted.

Surg. Lt. D. Q. Bawtree promoted to Surg. Lt.-Comdr.

Surg. Lt. E. R. G. Passe to be Surg. Lt.-Comdr.

Surg. Sub-Lt. K. E. O. Ringdahl to be Surg. Lt.

Proby. Surg. Lt. J. L. Dunlop to be Surg. Lt.

Proby. Surg. Lt. E. J. S. Woolley to *Pembroke* for R.N.B.

Proby. Surg. Sub-Lt. R. E. King to *Pembroke* for R.N. Hosp., Chatham.

ROYAL ARMY MEDICAL CORPS

Lt.-Col. W. A. Spong retires on ret. pay.

Maj. and Bt. Lt.-Col. J. G. Gill, D.S.O., O.B.E., M.C., to be Lt.-Col.

Short Serv. Commissions.—The undermentioned Lts. (on prob.) are confirmed in their rank: A. MacLennan, I. U. Young, J. O'Connell, E. J. Pryn, R. Phillipson, P. L. E. Wood, L. E. Odlum, J. G. M. A. Brunet, R. O. A. Leroux, B. d'E. Barclay, N. I. McLeod, G. S. Musgrove, P. R. Wheatley, A. C. Cox, J. J. Groome, J. S. Kelleher, C. Ryan, J. McN. Lockie, W. B. Hamilton, D. S. Cochran, T. P. O'Brien, N. A. Flaherty, and J. P. Weir.

ARMY DENTAL CORPS

Bernard Edward ffrench is granted a temp. commn. in the rank of Lt.

TERRITORIAL ARMY

Col. W. A. Thompson, T.D., retires on completion of tenure as A.D.M.S., 50th (Northumbrian) Div., and retains his rank.

Lt.-Col. and Bt. Col. R. Errington, M.C., M.D., to be Col. and A.D.M.S., 50th (Northumbrian) Div.

Capt. A. O. Bekenn to be Maj.

Capt. D. G. Robinson resigns his commn.

ROYAL AIR FORCE

Flying Offr. H. L. Willcox to No. 6 Flying Training School, Netheravon.

INDIAN MEDICAL SERVICE

Maj. R. A. Warters to be Lt.-Col.

Lt. (on prob.) G. P. Charlewood to be Capt. (on prob.).

The undermentioned officers retire: Col. A. H. Proctor, D.S.O., and Lt.-Col. K. G. Gharpurey.

The undermentioned appt. has been made in India: *D.A.D.M.S.*—Maj. P. F. A. Grant, O.B.E., I.M.S.

The Commander-in-Chief has approved the following appointments in India: Col. W. T. McCowen as Assistant Director of Medical Services, Baluchistan District, and Lt.-Col. S. G. S. Haughton, O.B.E., to act for him while on leave.

COLONIAL MEDICAL SERVICE

A. D. Williamson, M.B., Ch.B., F.R.C.S., has been appointed Ophthalmic Surgeon and Physician, College of Medicine, Singapore, Straits Settlements; and Dr. D. R. Griffith (Medical Officer, Achimota College) becomes Medical Officer, Gold Coast.

Births, Marriages, and Deaths

BIRTHS

CASHELL.—On Sept. 6th, at Reading, the wife of Willoughby Cashell, M.B. Lond., of a son.

EDMONDSON.—On Sept. 1st, the wife of E. L. Edmondson, M.R.C.S. Eng., Leamington Spa, of a daughter.

HUTCHINSON.—On Sept. 4th, at Haywards Heath, Sussex, the wife of H. Procter Hutchinson, M.B. Camb., of a son.

RIDDELL.—On Sept. 5th, at Baldock, Herts, the wife of D. Renton Riddell, M.B. Leeds, of a son.

VALENTINE.—On Sept. 3rd, at Green-street, W., to Lady Freda, wife of F. C. O. Valentine, M.R.C.P. Lond.—a son.

WILCOX.—On Sept. 1st, at King's Lynn, the wife of S. Murray Wilcox, M.R.C.S. Eng., of a son.

MARRIAGES

BARRETT—WRIGHT.—On Sept. 3rd, at St. John the Divine Church, Leicester, John Cridlan Barrett, V.C., F.R.C.S. Eng., to Ernestine Helen, only child of Mr. Ernest Wright of Birstall, Leicestershire.

HUGHES—SMITH.—On Sept. 5th, at the Catholic Cathedral, Shrewsbury, William Stanley Hughes, M.B. Lond., to Elizabeth Patricia Smith, widow of Walter R. H. Smith, M.D., of Bicton Heath.

PEARCE—WALLACE.—On Sept. 7th, 1935, at Chelsea, James G. Pearce, M.Sc., M.I.E.E., F.Inst.P., to May Isabel Wallace, M.B., Ch.B. Birm., D.P.M.

TAYLOR—ROBINSON.—On Sept. 7th, at St. Peter's Church, Ealing, Wallace Antony Frederic Taylor, M.R.C.S. Eng., to Beryl, daughter of Major R. A. Robinson of Ealing.

TERRY—HALSTEAD.—On August 31st, at Mill Hill Chapel, Leeds, James Oliver Terry, M.B. Leeds, M.R.C.P., to Dorothy Halstead, M.Sc., M.B. Leeds, eldest daughter of Mr. and Mrs. T. Halstead of Rodley.

DEATHS

DORGAN.—On Sept. 1st, at Flagstaffe House Convalescent Hospital, Southport, James Dorgan, M.B. R.U.I., D.P.H., Lt.-Col. R.A.M.C., retd., superintendent of the hospital.

HAMILTON.—On Sept. 1st, at Southampton, Herman Lauder Hamilton, M.B. Aberd., D.P.H., in his 60th year.

ROSE.—On Sept. 1st, at Aberdeen, George Rose, M.B. Aberd., D.P.H., aged 80.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

BOVEY TRACEY HOSPITAL.—Miss Violet Wills has laid the foundation-stone of a children's jubilee ward at this hospital.

MEDICAL NEWS

University of Cambridge

Dr. J. A. Ryle has been appointed regius professor of physic in the university in succession to Sir Walter Langdon-Brown.

John Alfred Ryle, the son of Dr. R. J. Ryle of Brighton, was born in 1889 and educated at Brighton College and Guy's Hospital medical school. He graduated M.B. Lond. in 1913, being awarded the gold medal of the university. When war broke out he was released from his third resident appointment at Guy's to join the R.A.M.C. (S.R.) and served as a captain in France and Belgium from 1914 to 1918. He returned to Guy's in 1919 as medical registrar, and in the same year took his M.D., receiving another gold medal. He acted as assistant in the children's department and Astley Cooper assistant to the curator of the Gordon Museum until 1920, when he was appointed assistant physician to the hospital and demonstrator in morbid anatomy and medical pathology. Dr. Ryle was elected a fellow of the Royal College of Physicians of London in 1924, and the following year was chosen to deliver the Goulstonian lectures on Gastric Function in Health and Disease, published in our columns and later in book form; and in 1932 gave a Hunterian lecture on the Natural History of Duodenal Ulcer to the Royal College of Surgeons of England. In 1929 he became physician to Guy's, and in 1932 he was appointed physician to His Majesty's Household. Dr. Ryle's contributions to medical literature have covered a wide range, including philosophical reviews as well as original contributions to medical science, notably in connexion with diseases of the intestinal tract and the cardiovascular system.

British Congress of Obstetrics and Gynæcology

The 1936 meeting of the British Congress of Obstetricians and Gynæcologists will be held in Belfast from April 1st to 3rd under the presidency of Prof. R. J. Johnstone. The subject for discussion will be conservative treatment, by operation or otherwise, of pathological conditions of the ovaries, tubes, and uterus, with special reference to functional results. Mr. C. H. G. Macafee, 18, University-square, Belfast, is the local scientific secretary.

Central London Throat, Nose, and Ear Hospital

A course in methods of examination and diagnosis will be held at this hospital from Sept. 30th to Oct. 4th at 4.30 daily. A course in anatomy and physiology for Part I. of the D.L.O. examination will be given by Dr. Archibald Durward from Oct. 7th to Oct. 19th, while a clinical course for Part II. has been arranged to take place from Oct. 21st to Nov. 2nd.

The annual address of the hospital will be given at 4 P.M. on Friday, Oct. 11th, by Mr. A. Brown Kelly, consulting surgeon for diseases of throat and nose at the Victoria Infirmary, Glasgow. He will speak on the œsophagus in young children. The usual Friday lectures, to which medical visitors are invited, will be held throughout the winter and will be announced in our Weekly Diary.

King's College Hospital

Lectures and demonstrations, open to all medical practitioners, will be held at this hospital on Saturday, Oct. 5th, from 11 A.M. to 6 P.M., and on Sunday morning, Oct. 6th, before the beginning of the new session. The annual dinner of past and present students will take place at 8 P.M. on Oct. 5th at the Mayfair Hotel, London, W., with Sir Charlton Briscoe in the chair. The inaugural lecture will be given at 4.30 P.M. on Thursday, Oct. 10th, by Dr. G. F. Still. From Oct. 3rd to Dec. 12th a post-graduate course of lectures on tuberculosis will be given at the medical school on Thursdays at 9 P.M., to which practitioners are also invited.

Welsh National School of Medicine, Cardiff

On Sept. 4th the Merioneth county council received a deputation asking that the rate-aided contributions to the school from the county should be resumed. Dr. Joyce, pro-chancellor of the University of Wales, spoke of the importance of medical services and said that a united Wales should stand behind a national institution. Mr. Jenkin James, secretary of the school, said that if Merionethshire decided to resume contributions it was probable that Newport borough and Radnor county council would fall into line, and this would mean an increase of £400 in the income of the school. After discussion the council unanimously agreed to resume payments.

A PORTRAIT of Sir Robert Jones, intended to commemorate his work and that of Hugh Owen Thomas, was unveiled by Dame Agnes Hunt on Sept. 4th at the Ceiriog Memorial Institute at Glyn Ceiriog.

THE meeting of the Continental Anglo-American Medical Society arranged for Oct. 5th in Paris has been postponed indefinitely.

University of Liverpool

Dr. H. H. Stones has been appointed Louis Cohen professor of dental surgery and director of dental education at the university in succession to Prof. W. H. Gilmour, who has retired. Dr. Stones is honorary dental surgeon to University College Hospital dental school, and has been in practice in London and St. Leonards.

Middlesex Hospital Medical School

The annual refresher course for former students of this school will begin on Saturday, Sept. 28th, at 2.15 P.M., and continue up to the evening of Oct. 1st. The annual dinner for past and present students and their friends will be held on Tuesday, Oct. 1st, at the Savoy Hotel, at 7 for 7.30 P.M. Dr. H. Campbell Thomson will take the chair.

London Hospital

Sir William Goschen, chairman of this hospital, spoke at a meeting of the court of governors of his own experience, as a patient, of the efficiency of the administration of the hospital. He detailed the scheme to erect a block for paying patients so that persons of moderate means might have the benefits of the skilled treatment that the hospital could offer.

Hull Contributory Scheme

In the five years this scheme has existed over £100,000 has been given to the hospitals taking part. The present membership totals 67,000, and this is by no means regarded as saturation point, especially in the rural districts.

Donation to Radcliffe Infirmary, Oxford

Lord Nuffield has given £8000 to this hospital for the construction of a new medical ward and accommodation for its nursing staff.

Stratton Cottage Hospital

The wards in this hospital, said to be the second oldest cottage hospital in the country, had become out of date and the Bishop of Truro recently opened a large modern ward and two private wards there.

Child Guidance in Sheffield

An address was given by Dr. William Moodie, medical director of the London Child Guidance Clinic, at a meeting held recently at the University of Sheffield, to consider what could be done to provide a child guidance clinic for the city. A committee was appointed to consider the question, which included the following medical members: Dr. Thomas Chetwood, Prof. A. E. Naish, Dr. Helen Wilson, Dr. E. Fretson Skinner, Dr. Arthur Pool, Dr. F. E. E. Schneider, Dr. A. G. Yates, and Dr. Annie Greenep.

Institute of Medical Psychology

Five seminars on fundamental psychological conceptions will be given by Prof. C. G. Jung of Zurich from Sept. 30th to Oct. 4th at 7.45 P.M. at the institute. The meetings will be open to medical graduates and to professors, readers, and lecturers of the University of London. Application for tickets should be made in advance to the educational secretary of the institute, Malet-place, London, W.1.

Other courses to be held during the year include a five weeks' introductory course on psychotherapeutic theory and method which will be given on Monday and Thursday afternoons from Oct. 7th to Nov. 7th; a post-graduate course on this subject will also start on Oct. 7th, and during the session will cover the work required for the D.P.M. On Tuesdays, from Oct. 22nd to Dec. 10th, at 6 P.M., Dr. Emanuel Miller will lecture on problems of parenthood.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Sept. 16th, to SATURDAY, Sept. 21st.—WESTMINSTER HOSPITAL. All-day post-graduate course in medicine and surgery. (Men only.)

Appointments

KERSHAW, J. D., M.B. Lond., D.P.H., has been appointed Medical Officer of Health for Accrington.

PATTERSON, W. G., M.D. Edin., M.R.C.P. Lond., D.P.H., Medical Officer of Health for Barnsley.

West End Hospital for Nervous Diseases.—The following appointments have been made:—

GOITEIN, P. L., M.B. Lond., D.P.M., Hon. Medical Psychologist to the Child Guidance Unit.

LLOYD, J. E. SETON, M.B. Liverp., D.P.M., Hon. Clinical Psychologist to the Out-patient Department.

LUCAS, R. E., M.B. Brist., Hon. Medical Psychologist to the Child Guidance Unit.

Vacancies

For further information refer to the advertisement columns

Aberdeen Royal Hospital for Sick Children.—Hon. Asst. Surgeon to Ear, Nose, and Throat Dept.

Aberdeen Royal Infirmary.—Hon. Jun. Asst. Surgeon to Ear, Nose, and Throat Dept.

Abyssinia Ambulance Unit.—Volunteers.

Altrincham General Hospital.—Sen. and Jun. H.S.'s. £150 and £120 respectively.

Aylesbury, Royal Buckinghamshire Hospital.—Second Res. M.O. At rate of £150.

Bath and Wessex Children's Orthopædic Hospital, Combe Park.—H.S. At rate of £120.

Bath Royal United Hospital.—H.S. At rate of £150.

Birmingham and Midland Eye Hospital.—H.S. At rate of £130.

Birmingham, Dudley-road Hospital.—Jun. M.O. At rate of £200.

Bolton Royal Infirmary.—H.S. £125.

Bradford Children's Hospital.—H.S. £100.

Bradford City.—Asst. School M.O. £500.

Bradford Royal Eye and Ear Hospital.—Jun. H.S. £160.

Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £120.

Bristol, Southmead Municipal Hospital.—Asst. Res. M.O. £250.

British Empire Cancer Campaign, 12, Grosvenor-crescent, S.W.—Assts. for Cancer Research Laboratory. Each £350 to £400.

Cancer Hospital, Fulham-road, S.W.—Asst. Radiologist. £350.

Chester County Mental Hospital.—Jun. Asst. M.O. £350.

Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall.—H.P. At rate of £150.

Coventry and Warwickshire Hospital.—Res. H.S. Also Cas. O. Each £125.

Derbyshire County Council.—Tuberculosis Officer. £750.

Doncaster Royal Infirmary.—H.S. to Eye and Ear, Nose and Throat Depts. £175.

Doncaster Royal Infirmary and Dispensary.—Sen. Res. £250. Also Res. Anæsthetist. At rate of £175.

Dreadnought Hospital, Greenwich, S.E.—Med. Supt. £250

Durham County Council.—Asst. Welfare M.O. £500.

Ealing Borough.—Asst. M.O.H. £600.

Eastbourne, Princess Alice Memorial Hospital.—Res. H.S. £150.

Eastern Dispensary, Leman-street, E.—Gynæcologist.

East Ham Memorial Hospital, Shrewsbury-road, E.—H.S. to Spec. Depts. and Cas. O. At rate of £120.

Edinburgh Royal Infirmary.—Clin. Asst. for Ear, Nose, and Throat Dept. £105.

Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Surg. Reg. £100.

Evelina Hospital for Sick Children, Southwark, S.E.—H.P. At rate of £120.

Fareham, Hants, Knowle Mental Hospital.—Jun. Asst. M.O. £350.

Gloucestershire Royal Infirmary.—H.P. At rate of £150.

Gloucestershire Royal Infirmary and Eye Institution.—Res. Surg. O. At rate of £200.

Guildford, Royal Surrey County Hospital.—Res. Surg. O. £250. Also H.P. and Cas. O. £150.

Halifax Royal Infirmary.—Res. Surg. O. At rate of £250.

Hospital for Sick Children, Great Ormond-street, W.C.—Research Fellow for Morbid Anatomy. £500. Res. Med. Supt. £300. Asst. M.O. £300. Also Out-patient Med. Reg. £250.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.S. At rate of £75.

Hove General Hospital.—Res. M.O. At rate of £150.

Huddersfield Royal Infirmary.—H.S., H.P., and Res. Anæsthetist. Each at rate of £150.

Huddersfield, St. Luke's Hospital.—Res. M.O. £200.

Ilford, West Ham Mental Hospital, Goodmayes.—Jun. Asst. M.O. £350.

King's College Hospital, S.E.—Registrar to Ear, Nose, and Throat Dept.

Leicester Royal Infirmary.—Jun. Res. Anæsthetist. At rate of £150. Also Sen. Cas. O. £125.

Leicestershire County Council.—Asst. County M.O.H. £700.

Liverpool County Borough.—Two Jun. Asst. School M.O.'s. Each £500.

Liverpool, County Mental Hospital, Rainhill.—First Asst. M.O. £700. Second Asst. M.O. £650.

Liverpool Royal Babies' Hospital, Woolton.—Res. M.O. At rate of £90.

Maidstone, Kent County Ophthalmic and Aural Hospital.—Ophth. H.S. At rate of £200.

Maidstone, West Kent General Hospital.—Two H.S.'s. Also H.P. Each £150.

Manchester, Ancoats Hospital.—H.S. for Ear, Nose, and Throat Dept. At rate of £100.

Manchester, Booth Hall Hospital.—Jun. Asst. M.O. At rate of £200.

Manchester Hospital for Consumption and Diseases of the Throat and Chest.—Res. M.O. for Ear, Nose, and Throat Dept. £200.

Mansfield, Harlow Wood Orthopædic Hospital.—Two H.S.'s. Each at rate of £200.

Margate and District General Hospital.—Res. M.O. £150.

Middlesbrough Education Committee.—Sen. Asst. School M.O. £500.

Middlesbrough, North Ormesby Hospital.—Hon. Orthopædic Surgeon.

Middlesbrough, North Riding Infirmary.—Third H.S. £125.

New Zealand, University of Otago and Dunedin Hospital.—Sen. Res. M.O. £500.

Northampton General Hospital.—Hon. Obstet. Surgeon. At rate of £150.

North Riding of Yorkshire County Council, &c.—Two M.O.H.'s. Each £800.

Norwich, Jenny Lind Hospital for Children.—Res. M.O. £120.

Norwich, Norfolk and Norwich Hospital.—H.P. £120.

Nottingham General Dispensary, Gregory Boulevard Branch.—Res. Surgeon. £250.

Nottingham General Hospital.—H.S. for Ear, Nose, and Throat Dept. Also Cas. O. Each at rate of £150.

Plymouth Education Committee.—Asst. School M.O. £500.

Princess Elizabeth of York Hospital for Children, Shadwell, E.—H.P. At rate of £125.

Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. O. Each at rate of £100.

Reading, Royal Berkshire Hospital.—Res. H.P., Res. Cas. O., also Res. M.O. for Blagrave Branch Hospital. Each at rate of £125.

Richmond Royal Hospital.—Jun. H.S. At rate of £100.

Rotherham Hospital.—Cas. H.S. £150.

Royal London Ophthalmic Hospital, City-road, E.C.—Sen. Res. Officer. £150.

St. Mary's Hospital, W.—Surg. Reg. £200. Also Obstet. Reg. and Jun. Clin. Asst. for X Ray Dept. Each £50.

St. Thomas's Hospital, S.E.—Surgeon. Also Surgeon to Out-patients.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100.

Sheffield, Jessop Hospital for Women.—Two H.S.'s. Each at rate of £100.

Sheffield Royal Infirmary.—Clin. Asst. for Dermatological Dept. £300.

Sidcup, Queen Mary's Hospital.—Asst. M.O. £350.

Southampton.—Part-time Antenatal M.O., Gyn. and Con Obstet. At rate of £300.

Southend-on-Sea General Hospital.—H.S. At rate of £100.

Stamford, Rutland and General Infirmary.—H.S. At rate of £250.

Swanley, Kent, Alexandra Hospital for Children.—Res. Asst. M.O. At rate of £200.

Swansea General and Eye Hospital.—H.P. Also Temp. H.S. Each at rate of £150.

University College Hospital, Gower-street, W.C.—Tuberculosis Officer. £300.

West End Hospital for Nervous Diseases, Welbeck-street, W.—Hon. Asst. Surgeon.

Wigan, Royal Albert Edward Infirmary and Dispensary.—H.S. At rate of £150.

Willesden General Hospital, Harlesden-road, N.W.—Res. Officer. At rate of £100. Also Asst. Surg. O. £50.

Wokingham, Berks, Pinewood Sanatorium.—Asst. M.O. £550.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Dingwall (Ross) and Stapleford (Nottingham).

SWINDON VICTORIA HOSPITAL.—More beds are needed at this hospital, while there has been a large increase in the out-patients' department. An average of four beds has been occupied by road accidents, with an average stay of 15·8 days. The outlay for these cases has been considerable, and the full cost of treatment has rarely been recovered. There was an excess of income over expenditure of £13 owing to some substantial legacies and the contributory receipts were over £5000.

NOTES, COMMENTS, AND ABSTRACTS

OTO-RHINO-LARYNGOLOGICAL CLINICS IN BOSTON AND PHILADELPHIA

By Maxwell Ellis, M.D. Lond., F.R.C.S. Eng.
SENIOR REGISTRAR, GOLDEN SQUARE THROAT HOSPITAL

During my tenure of the Geoffrey E. Duveen Travelling Studentship I worked at the Massachusetts Eye and Ear Infirmary, Boston, from Feb. 1st to May 1st, 1934, and at the Chevalier Jackson Bronchoscopic Clinic, Philadelphia, for eight months in 1933 and 1934. I have set out below a brief account of these clinics for the benefit of those who have not had the privilege of visiting them.

The Massachusetts Eye and Ear Infirmary, Boston

In 1824 two Boston doctors started a free clinic for the treatment of diseases of the eye. This occupied only a single room, but was so successful that a fund was started and the money was raised to found the Boston Eye Infirmary in 1826. This grew rapidly, and in 1827 moved to larger quarters and was formally incorporated as the Massachusetts Charitable Eye and Ear Infirmary. The hospital continued to expand and was moved several times, until it arrived, in 1899, at its present site overlooking the Charles River. For many years the eye department was the more important one, but in 1922 the laryngological department of the Massachusetts General Hospital became an integral part of the infirmary, closely related with the ear department, and in 1925 the aural and laryngological surgeons appear in one group as "oto-laryngologists." In 1924 the name of the infirmary was changed by the omission of the word "charitable."

The building.—To-day the infirmary contains 250 beds, equally divided between the ophthalmologists and oto-laryngologists. The basement of the building is occupied by the kitchens, dining-rooms (for the nurses and house-officers), furnaces, and other domestic offices.

The ground floor contains a large laboratory, where the routine pathology and the research work connected with the oto-laryngology department is conducted. It can also be used as a lecture-room, and is equipped with projection cameras for lantern and microscope slides, moving pictures, and a special one for projecting X ray negatives, as well as an orthodiagraph. This laboratory was designed by Dr. H. P. Mosher, the chief of the staff, to fulfil these several functions, and has been furnished largely at his own expense, to include every device for photography and microphotography. The X ray department, the laboratory (with a specially endowed library) belonging to the ophthalmology department, and the various business offices occupy the remainder of the floor. The X ray department is well equipped, and has a large room for fluoroscopy, much used in the treatment of patients with œsophageal disease, and also in the endoscopic removal of certain radio-opaque foreign bodies.

The first floor consists of the male wards and the four operating theatres, equally divided between the two departments. The out-patient department, a very spacious and well-equipped one, is also on this level, in a special building devoted otherwise to the out-patient departments of the adjoining Massachusetts General Hospital. These three buildings, the two hospitals and the out-patient block between them, communicate with each other on every floor.

The third floor contains the female and children's wards, again equally divided; and the top floor consists entirely of single rooms for private patients, and an operating theatre, where all operations on private patients are performed.

There is a separate building adjacent to the infirmary, the lower half of which contains isolation wards for very septic cases or suspected cases of infectious fevers. The house-officers' quarters are in the upper half.

Private patients.—Connected by underground passages with the two hospitals already mentioned are two others for private patients, the Phillips' House, which is very luxurious, and the Baker Memorial Hospital, for persons of moderate means. All members of the staff have the privilege of sending their private patients to these hospitals.

Association with general hospital.—Thus, although the Massachusetts Eye and Ear Infirmary is an independent organisation as far as finance and policy are concerned, it is closely associated with the Massachusetts General Hospital (which can be regarded as the parent institution of the group) to the benefit of both. This association takes practical shape in the joint filing and keeping of records, and in the formation of various clinics, such as the tumour, allergy, and thoracic clinics, presided over by members of both hospitals. The nursing staff of the infirmary is supplied from the main hospital.

Charges made to patients.—Adult out-patients are charged seventy-five cents for the first visit and fifty cents for each subsequent visit. For children under 16 years of age, these figures are, respectively, fifty and twenty-five cents. In-patients pay what they can afford. All investigations, such as X ray and blood counts, are added to the cost borne by the patient, and a very efficient almoner's department takes care of this aspect of affairs. Many patients, however, are treated free.

Staffing.—So far the organisation will have been seen to differ little in essentials from that of our own hospitals. It is in the method of staffing where fundamental differences begin to appear. First of all there is a director of the whole hospital. He is always a doctor, is appointed by the board of trustees, and organises the medical and business administration. His influence is not always openly visible, but it is nevertheless constantly present. The post is now held by Dr. George H. Bigelow. Under him are two main executive officers, Dr. Frederick H. Verhoeff, the chief of ophthalmology, and Dr. Harris P. Mosher, the chief of oto-laryngology and professor of oto-laryngology in the Harvard medical school. Each is a virtual dictator in his own department, but answerable to the director and trustees. These three men are paid salaries, and do not engage in practice outside the infirmary. They have their private consulting-rooms in the infirmary, and are allowed to see a certain number of private patients—a nurse and a stenographer is provided for each of them. Appointments to the staff originate by recommendation from the board of surgeons, but the chiefs of staff and director wield considerable influence in this regard.

The oto-laryngology department is subdivided into otological and laryngological sections. There are three full surgeons to each section, and each takes his turn for four months at a time—this is known as being "on service." Thus each surgeon for eight months of the year has no hospital commitments as far as non-paying patients are concerned. He has an associate and an assistant surgeon, and several clinical assistants attached to his "service." The whole acts as a unit and deals with the out- and in-patient work of the public wards. This is known as the system of "rotating services," and is widely used in the United States. It gives opportunities to more younger men than our own system, and allows the older men with established practices a respite, other than their annual vacation, from hospital work. When not "on service," the staff members are privileged to use the private wards. The various "services" are welded into a homogeneous whole in the way I shall soon describe.

The X ray department is under the charge of an officer (Dr. A. S. Macmillan) who is paid a salary and

attends at the infirmary every morning until lunch-time. The out-patient clinics take place, and all operations, except emergencies, are performed in the morning. Nearly every patient is X rayed for sinus, mastoid, or laryngeal disease. Nurses trained to the work take these films. The officer in charge attends regularly in the operating theatres, and with experience becomes skilful at correlating the information thus acquired with the X ray appearances. He personally conducts all the fluoroscopic examinations and gives a full report on each film.

All material removed at operation is sent down to the laboratory, and the sections prepared from it are reported upon by the assistant in the laboratory, in consultation with Dr. Tracy B. Mallory, the chief of the pathological department of the Massachusetts General Hospital. The assistant is not paid a salary, and usually occupies the post as a preliminary to becoming a house-officer.

Finance.—The infirmary depends financially upon its endowments, which are moderate, on fees paid by patients, which form the bulk of the income, and on voluntary contributions, a very variable factor. The patients pay more than they would in similar English institutions; on the other hand, much extra expenditure is involved in the salaries paid to the various members of the staff to ensure their full-time work.

TEACHING METHODS

Undergraduates.—Teaching methods employed by Dr. Mosher in the department of laryngology and otology may be of interest. The students in the Harvard medical school receive a course of lectures on the diseases of the ear, nose, and throat, and are made to practise with the head-mirror on specimens before doing so on patients. Many ingenious preparations have been devised for this purpose. For example, one consists of a head from a cadaver mounted in a wooden frame on which to practise indirect laryngoscopy and anterior rhinoscopy. Another is a half-head sectioned so that the ear drum is the dividing line between the superficial and deep portions. The drum is removed, and a small piece of paper with a printed representation of a drum is used to replace it. Paracentesis can conveniently be practised on such a model. Senior students are allowed to examine patients, and attendance at many demonstrations in the out-patient department is compulsory. As a result the average Harvard medical student has opportunity to acquire considerable technical skill in oto-rhino-laryngological examination. Certain members of each "service" are assigned for teaching in rotation.

The *post-graduate* course in rhinology and laryngology is given by Dr. Mosher. It is founded on two principles: (1) that a sound knowledge of anatomy and pathology is essential, and that this is likely to be lacking in men who have been engaged in practice for any length of time, which men form the bulk of the post-graduate students; (2) that anatomy can best be learnt by dissection, and pathology by the study of morbid specimens and slides. Thus a number of cadaver heads and half heads is issued to each man for dissection. He then draws his specimens (using a drawing-box) and makes plaster casts of certain of them. There can be little doubt that he will remember the anatomical features of a specimen which he has dissected, drawn, and cast in plaster and painted, and in any case he retains the cast as a reminder. It takes very little time to learn to produce an average cast though a really artistic one demands much skill. The whole head and neck, with the brain, is thus dissected, drawn, and modelled. In addition, there are lectures on anatomy, pathology, and neurology, and many slides are issued for study. Each man has to prepare a paper which he reads to the whole class, illustrating it with specimens or lantern slides. Regular viva voce examinations are held weekly. At the conclusion of the six weeks' course, each man has a number of plaster casts which he can take home to serve as a three-dimensional atlas.

Resident appointments.—As has been noted above, a man waiting for resident appointment can sometimes obtain a post as assistant in the laboratory, where he is trained in the technique of section-cutting, microphotography, and in histo-pathology and in methods of research. He also spends some time in the out-patient and X ray departments and learns enough about the technique of preparing plaster casts of dissections to demonstrate to post-graduates. About a year is thus spent in pathology as a preliminary to the 22 months as a resident. During this latter period, the house-officer spends three months in each of the various "services." His first three months are occupied with routine clinical pathology. All in-patients have blood counts performed on admission; the house-officer also examines all specimens of cerebro-spinal fluid, and is responsible for taking a full history of every patient on admission. His experience includes three months with the plastic surgeon (Dr. V. I. Kazanjian).

Consultations and discussions.—Every Wednesday morning at 11.30, a meeting of all members of the staff is held in the laboratory when microscope slides from recent cases are projected and described by the assistant, and any unusual cases of the week are presented by the residents. A free discussion follows. Once a month the meeting is devoted to cases which have proved fatal.

Other meetings are held on Friday evenings in the Harvard medical school, where an article of interest from the current journals is assigned to each house-officer, whose task is to present it in abstract, illustrating it as best he can with the material at hand, or making models and drawings himself. As his paper is open to discussion, he must also have familiarised himself with the bibliography given with the article, and with other work which this may not have included.

On Monday evenings, a selected member of the staff dines with the residents and afterwards gives an informal talk on a previously determined subject.

It will be seen that a young doctor who has spent three years at the Massachusetts Eye and Ear Infirmary will have received an excellent training in anatomy and pathology, will have seen a large amount of clinical work critically handled, will have had considerable operative experience, and will have learned how to present cases and papers before an expert audience.

The Chevalier Jackson Bronchoscopic Clinic, Philadelphia

In 1907 Dr. Chevalier Jackson published his first book on endoscopy, a prelude to a larger and more complete work which appeared in 1915. He built up his first bronchoscopic clinic in Pittsburgh, but came to Philadelphia in 1917 and set up a clinic at the Jefferson Hospital. Later on he developed two more at the Graduate and University hospitals, and in 1930 a third at Temple University Hospital, to which he now devotes his sole attention; over five thousand new cases from all over the world were dealt with at this clinic last year. His enthusiasm and inventive capacity remain unimpaired, and he is still in pursuit of the ideal of an endoscopic clinic with a trained personnel as part of the standard equipment of every large general hospital.

This clinic is situated in the northern part of the city, four miles from the centre. Dr. Jackson insists that all visiting assistants must stay at least three months and must live near the hospital, but this does not apply to members of the fortnight's course which is given twice a year.

Buildings.—The clinic occupies a suite of rooms on the second floor of the Temple University Hospital. These consist of Dr. Jackson's private office, a changing-room, the main office, an examining-room, a scrubbing-up-room, a preparation-room, and the

operating theatre, with a stand for spectators. Each of these connected rooms opens also on to the passage.

Anæsthesia.—All patients, except children under 10 years of age, receive local anæsthesia (10 per cent. cocaine) before endoscopy. Out-patients who will be able to leave the hospital shortly after treatment, walk into the examining-room and are anæsthetised there. In-patients are brought up on carriages and wheeled into the preparation-room, where they are given their local anæsthesia.

The *personnel* of the clinic consists of Dr. Chevalier Jackson, the professor of bronchoscopy, his son, Dr. Chevalier L. Jackson, the professor of clinical bronchoscopy, Dr. E. Van Loon, the associate professor of bronchoscopy, and a clinical assistant, Dr. N. M. Levin. These three last-named are on salaries, and, with the exception of Dr. Van Loon, are full-time workers. The medical staff is completed by an unpaid assistant who stays for varying periods, not less than three months. This last post is generally filled for many months ahead.

The nursing staff consists of a head nurse and her assistant, both fully trained in the work, and a "pupil nurse," corresponding to a staff nurse in her last year of training. On operating days, another nurse is sent to the clinic. Each nurse has her own particular work in the team.

The *theatre* contains an operating table of the type designed by Dr. Jackson, a large cabinet draped with sterile sheets containing laryngoscopes, bronchoscopes, and œsophagoscopes, a movable stand for six dry-cell batteries, two electrically driven suction-pumps, and stands and tables for forceps, bougies, aspirators, swab-holders, sterile gowns, gloves, sheets, and head-holding towels; a set of instruments for tracheotomy is provided for emergencies.

Patients by appointment.—The clinic holds no out-patient department. All patients are referred by physicians from the various departments of the hospital or by outside doctors, and are given appointments. The secretaries who take a full history from each patient on arrival are not medically trained, but have acquired great skill in eliciting and setting out case-histories, and rarely omit anything of value.

Routine examination.—An ear, nose, and throat examination is made, and a thorough general examination, by the clinical assistant, the records being typewritten in triplicate. Then follow an X ray examination and a Wassermann reaction test. (All in-patients, by a Pennsylvania State law, have a blood count and an analysis of the urine performed on admission.) Cases of pulmonary disease and of suspicious tuberculous laryngeal disease have the sputum examined, if this has not already been done. Very often another physician is called into consultation, especially with children. No effort is spared to discover everything possible before an endoscopic examination is performed.

Types of cases and treatments.—The operating days are Mondays and Thursdays, and there is an average list of 25 patients. An average list (9/4/1934) of the tentative diagnoses of 27 cases is as follows: laryngeal stenosis, 5 cases; œsophageal stenosis, 5 cases; pulmonary abscess, 4 cases; bronchiectasis, 3 cases; papilloma of larynx, 2 cases; asthma, 2 cases; achalasia of the cardia, 1 case; cancer of the larynx, 1 case; "cough," 1 case; "dysphagia," 1 case; "hoarseness," 1 case.

For these patients the procedures adopted were: œsophagoscopy (7 cases); bronchoscopy (11 cases); direct laryngoscopy (9 cases).

Each doctor has his own patients, but occasionally a certain amount of interchanging takes place. Three doctors at least are essential in order to keep the list going without waiting between cases. One cocainises the patients in the preparation- or examining-room, while another holds the head for the operator.

Other treatments are carried on daily. These consist chiefly of dilatation of œsophageal stenoses by means of pneumatic dilators, retrograde bougies, or Hurst's mercury bougies. A certain number of patients come up for dressings. Each patient is given an appointment, so that, day by day, the work of the clinic follows definite and systematic lines.

Procedures other than endoscopic examinations are usually not undertaken on Mondays or Thursdays. All laryngeal operations except laryngectomies are performed by members of the clinic. Cases for laryngectomy, together with those for excision of a pharyngeal pouch (performed as a one-stage operation), are handed over to the senior surgeon, Dr. Wayne Babcock. In these latter cases, however, the endoscopist assists by passing an œsophagoscope into the pouch during the first part of the operation, and during the actual excision, reintroducing the œsophagoscope into the œsophagus to prevent removal of too much tissue with consequent stenosis. Gastrostomies are performed for the clinic by the general surgeons.

Foreign bodies.—All cases of foreign body, which form a little under 5 per cent. of the work of the clinic, undergo a searching clinical examination, and are then X rayed. The X ray department, under Dr. Edward Chamberlain, assisted by a large full-time staff, is magnificently equipped and renders invaluable information. The kind of foreign body, the length of time it has been present, and whether any previous attempts at removal have been made, are all taken into account in deciding when to operate. Removal in cases of small or peripherally situated radio-opaque pulmonary foreign bodies (and the rare cases of gastric foreign body) is performed under fluoroscopic guidance. To this end Dr. Chamberlain has designed a biplane fluoroscope embodying special features which lightens considerably the task of the endoscopist. It also affords the maximum of protection to the patient and bystanders. This apparatus is housed in a large room opposite the clinic, so that the pumps, batteries, and instrument table can easily be wheeled into it.

Teaching and research.—In the medical school another set of rooms is devoted to teaching and research. It contains four complete sets of instruments, operating tables for work on the cadaver and on dogs, numerous foreign bodies of all descriptions with which to practise, a lantern slide and a moving picture projector with a screen, numerous lantern slides and films, drawing paper, and chalks of a special make which Dr. Jackson uses effectively, and every conceivable device for endoscopic work and teaching. Every new assistant is given instruction here, first on the cadaver, and then on dogs, until his technique is considered sufficiently good for him to be allowed to work in the clinic itself. Dr. Jackson holds strongly that the education of the eye and the hand necessary for endoscopic work is best acquired by continual practice on the cadaver and on animals, and that the patient should not be the victim during the gaining of such skill.

It will be observed from the figures quoted above, of an average day's work, that although Dr. Jackson's interest in endoscopy was at first stimulated by the mechanical problems presented in the removal of foreign bodies from the bronchi and œsophagus, the clinic has long outgrown this limited sphere of usefulness. The clinic links up with nearly every other department of the hospital. Dr. Jackson believes that endoscopy has now reached the point where it should be regarded as one of the routine methods of clinical examination and treatment, and that medical students should be taught to consider it as such. This presupposes that the endoscopist has been thoroughly trained in general medicine and surgery as well as in direct endoscopy. In Philadelphia and also in other large American cities endoscopy is attaining this position in medical education and the supply of well-trained men is adequate.

In addition to cases with pulmonary and bronchial suppuration, many of which are given regularly recurring treatments, all cases of asthma are sent by the asthma clinic for bronchoscopy. It has been found that often an aspiration reduces the frequency

of the attacks, and that relief has followed the administration of an autogenous vaccine prepared from the aspirated secretion. Especially in children with pulmonary suppuration of unknown origin, bronchoscopy has frequently been of assistance, occasionally revealing an unsuspected foreign body, or helping, by regular aspirations, in the resolution of the suppurative process. The chest physicians are sending more and more of their cases to the clinic, as they realise how useful endoscopy may be to them. In carcinoma of the bronchus the growth often originates in the larger bronchi, within endoscopic view, and the possibility of early diagnosis in these days of rapidly improving technique in thoracic surgery may be of great importance.

Patients with dysphagia form the great majority of the œsophageal cases. The advantages of concentration of such cases are clear, especially for uncommon diseases such as achalasia of the cardia or non-malignant ulcerations or strictures at the lower end of the œsophagus.

The laryngeal cases are divisible into those with stenosis, chiefly children, and those with benign growths or malignant disease. Persistent hoarseness is the symptom for which most of the patients are sent to the clinic, and, owing to Dr. Jackson's insistence upon endoscopy in all such cases, he sees probably a higher percentage of cancer cases than any other laryngologist in which the prognosis of laryngofissure would be favourable. A large number of benign tumours of the cords are removed under direct vision, with complete relief of symptoms.

Gastroscopy is another growing aspect of the clinic's activities, the Schindler flexible gastroscope being used with satisfactory results in collaboration with the gastro-enterology department.

I have attempted to describe only the scope and some of the aims of the clinic, and have not entered into any discussion of the methods of treatment adopted in particular diseases. These have all been published by Dr. Jackson in a series of papers extending over a period of nearly forty years and are familiar to all laryngologists.

In all the work of the clinic insistence is laid upon painstaking preliminary investigation, gentleness of procedure, and examination by direct vision whereever possible.

MEDICAL AUTHORS IN THE THIRTEENTH CENTURY

THE medical literature of six and seven hundred years ago contemporary with the paramount activities of the church was mainly in the hands of clerical dignatories, and in the current "Annals of Medical History" this is clearly shown by an essay on the medical writers of the thirteenth century in England written by Dr. J. C. Russell. Medical literature in England held a high position with such contributors as (among those mentioned by Dr. Russell), Gilbertus Anglicus, Richard of Wendover, Roger of Lacock, Hugh of Evesham, and many others, whose names occur frequently in footnotes to historical articles and who come in here for reference. These writers, nearly all of them, held clerical office, at any rate as deacons, very usually as prebends or canons, or at least enjoyed the profits of some clerical endowment, and there is one cardinal among them. Many of them, and most who attained to any stable repute, were, as might be expected, general scholars, and their learned information with regard to medical matters was only incidental. The impression produced on Dr. Russell by his studies, as it will be by those who read his essay, is that these medical authors were a highly respected group, as often rewarded for other activities as for any professional medical service. The documents of the time do not discriminate between the masters of medicine and the scholars whose chief claim to recollection is their record of other activities than those of medicine, and often, as Dr. Russell says, only chance mention enables the label of physician to be affixed to their names. It is thus necessary for any who write on the general society of the thirteenth and fourteenth centuries to remember that the careers of those ancient writers cannot be used as typical of the general status of the medical profession of the day—they may have been as learned physicians as any of their time, for otherwise they would not have received the distinguished patronage of the Crown and the Church, but they dropped into medical authorship as incidentally as Silas Wegg dropped into verse. Actually their contributions to therapeutics in many cases remain unestablished, for it is clear from the copious references to their writings appended to Dr. Russell's essay that a great deal of work for the literary antiquarian remains to be done. Among these references the author of the famous work, "Rosa Medicinæ" apparently has escaped notice, but John of Gaddesden was of the epoch described, and has been credited by Norman Moore as suggesting Chaucer's "Doctour of Phisik." A delightful account of him was written some years ago by the late Dr. H. P. Cholmeley as a thesis for a doctorate.

SWISS MEDICAL YEAR-BOOK

THE *Schweizerisches Medizinisches Jahrbuch* for 1935 shows many improvements on earlier editions. It is because the country is small and compact that a medical survey can be so concise, but it is greatly to the credit of the editors, Dr. Felix Barth of Basle, Dr. Otto Leuch of Zurich, and Dr. (jur.) Hans Trüeb of Berne, that it should also be readable and attractive. The first hundred pages or so are taken up by a series of biographies and reviews, including a valuable conspectus of new drugs by P. Wolff of Geneva. Among the appendices are useful articles on the use of microscopic stains by the practitioner and on the removal of drug stains from fingers and clothes. The photographic illustrations of the various baths and health resorts are excellent. The Jahrbuch may be had from Benno Schwabe and Co., Basle, for nine Swiss francs.

LUIGI CORNARO [1]

Mr. George Cooke, in a preface of 31 pages, introduces us to an essay of 20 pages and 10 pages of mixed material consisting of a topical biographical note, some maxims on the prolongation of life by an unknown seventeenth century writer, and an essay by Addison extracted from *The Spectator*. The meat inside this considerable crust is an English translation of Luigi Cornaro's "Treatise on Temperance and Sobriety." In this work, which from internal evidence appears to have been written when the author was about eighty, the virtues of self-control life are set out, the conclusion being "that an orderly life is the most sure way and ground of health and long dayes, and the true and onely medicine of many diseases." Cornaro practised his rules of living with such success that he became a centenarian, and according to his grand-daughter, a Paduan nun, his mind did not decay, his sight and hearing were not affected, and, which is more difficult than the rest to believe, he sang at the end of his life "with as much strength and delight as he did at the age of 25 years." There seems insufficient material in the treatise to furnish ground for comparison of Cornaro's system of life with modern theories of diet, that being the task which Mr. George Cooke has set himself in the introduction, while the points which he puts out for the instruction of those who would enjoy a long and healthy life follow the teaching of many dietitians. His appreciation of the significance of figures may be judged by the fact that he does not seem to think an expectation of prolongation of life of about five years, as between 1871 and 1921, a considerable one.

[1] How to Live for a Hundred Years and Avoid Disease. A Treatise by Luigi Cornaro, the sixteenth century Italian centenarian. Translated by George Herbert, with an introduction by George Cooke. Oxford: The Alden Press. 1935. Pp. 63. 2*s*. 6*d*.